PB-230 726

POLLUTION OF THE NAVIGABLE WATERS OF BOSTON HARBOR AND ITS TRIBUTARIES, MASSACHUSETTS. PROCEEDINGS OF CONFERENCE SESSION (3rd) HELD AT BOSTON, MASSACHUSETTS ON OCTOBER 27, 1971

Environmental Protection Agency
Washington, D. C.

1971

DISTRIBUTED BY:

NTIS
National Technical Information Service
U. S. DEPARTMENT OF COMMERCE
5285 Port Royal Road, Springfield Va. 22151

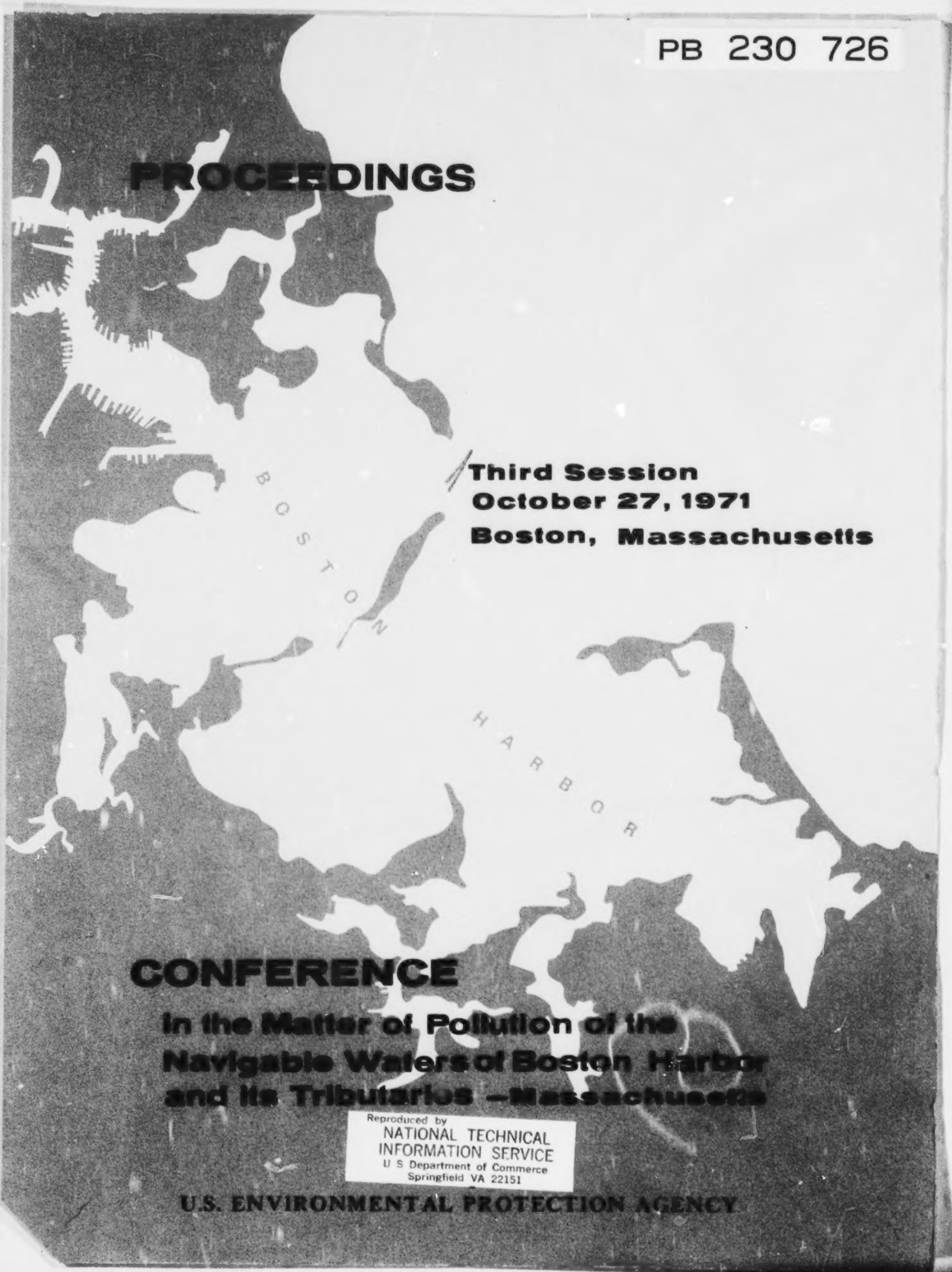
PB 230 726

PROCEEDINGS

Third Session
October 27, 1971
Boston, Massachusetts

CONFERENCE

In the Matter of Pollution of the Navigable Waters of Boston Harbor and its Tributaries —Massachusetts



Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
U S Department of Commerce
Springfield VA 22151

U.S. ENVIRONMENTAL PROTECTION AGENCY

THIRD SESSION
# of the
CONFERENCE
IN THE MATTER OF POLLUTION OF THE NAVIGABLE WATERS OF BOSTON HARBOR AND ITS TRIBUTARIES

held in
Boston, Massachusetts
October 27, 1971

TRANSCRIPT OF PROCEEDINGS

CONTENTS

	Page
Opening Statement - John R. Quarles, Jr.	11
Myron O. Knudson	17, 47
Alfred F. Ferullo	28
Martin Weiss	72
Charles H. W. Foster	83
John W. Sears	86
Guy C. McLeod	139
John P. King	141
Arthur W. Brownell	147
John C. Collins	162
Joseph F. Casazza	270
Thomas P. Callaghan	277
Thomas C. McMahon	286
Walter Newman	301
Donald L. Corey	317

The third session of the conference in the matter of pollution of the navigable waters of Boston Harbor and its tributaries convened at 9:45 a.m., on October 27, 1971, in the Roof Ballroom, Parker House, Boston, Massachusetts.

PRESIDING:

John R. Quarles, Jr.
Assistant Administrator for Enforcement and General Counsel
Environmental Protection Agency
Washington, D. C.

CONFEREES:

Murray Stein
Chief Enforcement Officer - Water
Environmental Protection Agency
Washington, D. C.

John A. S. McGlennon
New England Regional Administrator, Region I
Environmental Protection Agency
Boston, Massachusetts

Arthur Brownell
Commissioner, Massachusetts Department of Natural Resources and Chairman, Massachusetts Water Resources Commission
Boston, Massachusetts

Thomas C. McMahon
Director, Division of Water Pollution Control
Commonwealth of Massachusetts
Boston, Massachusetts

Walter M. Newman
Senior Staff Associate
New England River Basins Commission
Boston, Massachusetts

CONFEREES (continued):

Herbert R. Pahren
Director, Division of Enforcement
Environmental Protection Agency, Region I
Boston, Massachusetts

PARTICIPANTS:

Francis T. Bergin
Chief Engineer, Construction Division
Metropolitan District Commission
Boston, Massachusetts

Thomas P. Callaghan
Assistant to the Executive Director
Massachusetts Port Authority
and
Chairman, Boston Harbor Pollution Committee
470 Atlantic Avenue
Boston, Massachusetts

Joseph F. Casazza
Commissioner of Public Works
City of Boston
City Hall
Boston, Massachusetts

John C. Collins
Director, Division of Environmental Health
Massachusetts Department of Public Health
600 Washington Street
Boston, Massachusetts

Donald L. Corey
Supervisory Sanitary Engineer
Division of Water Pollution Control
Commonwealth of Massachusetts
Boston, Massachusetts

Alfred F. Ferullo
Environmental Bioengineer
Division of Water Pollution Control
Commonwealth of Massachusetts
Boston, Massachusetts

PARTICIPANTS (continued):

Charles H. W. Foster
Secretary of Environmental Affairs
Commonwealth of Massachusetts
Boston, Massachusetts

Allison C. Hayes
Director of Sewerage Division and Chief Sewerage Engineer
Metropolitan District Commission
Commonwealth of Massachusetts
20 Somerset Street
Boston, Massachusetts

John P. King
Associate Commissioner
Massachusetts Department of Public Works
100 Nashua Street
Boston, Massachusetts

Myron O. Knudson
Deputy Director
Surveillance and Analysis Division
Environmental Protection Agency, Region I
Boston, Massachusetts

Guy C. McLeod
Director of Research
New England Aquarium
Central Wharf
Boston, Massachusetts

John W. Sears
Commissioner, Metropolitan District Commission
20 Somerset Street
Boston, Massachusetts

Martin Weiss
Superintendent, Deer Island Treatment Plant
Metropolitan District Commission
P. O. Box 100
Winthrop, Massachusetts

ATTENDEES:

Mark Abelson, Regional Coordinator, Northeast Region
U. S. Department of the Interior
John F. Kennedy Federal Building
Boston, Massachusetts

Michael J. Ambrosino, Executive Producer,
WGBH-TV, 125 Western Avenue, Boston,
Massachusetts

Alan Anderson, Photographer, WHDH-TV
50 Morrissey Boulevard
Boston, Massachusetts

James B. Arbjthnot
Camp, Dresser & McKee
One Center Plaza, Boston, Massachusetts

James B. Ayres, Environmental Writer
The Boston Globe
Boston, Massachusetts

Joseph A. Beecardy, Assistant Regional Supervisor
Bureau of Sport Fisheries & Wildlife
U. S. Department of the Interior
Post Office and Courthouse
Boston, Massachusetts

Irving H. Beck, Director, Interstate Relations
New England Council, Inc.
1032 Statler Building, Boston, Massachusetts

Pam Bishop, Boston Herald-Traveler
300 Harrison Avenue, Boston, Massachusetts

Michael H. Bonoff, Executive Secretary
Boston Conservation Commission
One City Hall Plaza, Boston, Massachusetts

Judson G. Brown, President
Granger Filter Company
33 Tuttle Street, Wakefield, Massachusetts

ATTENDEES (continued):

Mrs. Janice Burrows
22 Lawrence Street, Swansea, Massachusetts

Samuel Cabot, President
Samuel Cabot, Inc.
One Union Street, Boston, Massachusetts

Joseph Capone, Contract Engineer, Construction Division
Metropolitan District Commission
20 Somerset Street, Boston, Massachusetts

Charles Calley, United Press International

Joseph P. Carney, City Engineer
City of Cambridge
City Hall, Cambridge, Massachusetts

James F. Carter, Sewer Division
Public Works Department, City of Boston
716 City Hall, Boston, Massachusetts

Richard J. Chalpin, Sanitary Engineer
Massachusetts Department of Public Health
600 Washington Street, Boston, Massachusetts

James M. Ciskowski, Worcester Polytech, ESSP
79 Old Upton Road, Grafton, Massachusetts

Martin F. Cosgrove, Deputy Chief Engineer
Metropolitan District Commission
20 Somerset Street, Boston, Massachusetts

Samuel B. Cutler, Administrative Assistant
Metropolitan District Commission
20 Somerset Street, Boston, Massachusetts

K. P. Devenis, Vice President
C. A. Maguire & Associates
60 First Street, Waltham, Massachusetts

Philip E. Doherty, Auditor
U. S. General Accounting Office
1903 John F. Kennedy Federal Building
Boston, Massachusetts

ATTENDEES (continued):

Peter A. Dore, Chemical Engineer
Massachusetts Division of Water Pollution Control
100 Cambridge Street, Boston, Massachusetts

Mrs. Elizabeth L. Forbes
Boston League of Women Voters
72 Mt. Vernon Street, Boston, Massachusetts

Richard I. Furbush, Secretary
Metropolitan District Commission
20 Somerset Street, Boston, Massachusetts

Andrew P. Fisichell, Assistant Superintendent
Metropolitan District Commission
Boston, Massachusetts

Henry S. Francis, Jr., Assistant Secretary,
Environmental Affairs
Commonwealth of Massachusetts
18 Tremont Street, Boston, Massachusetts

David F. Gardner, Principal Planner
Metropolitan Area Planning Council
44 School Street, Boston, Massachusetts

Roger Goodrich, Reporter, WHDH-TV
50 Morrissey Boulevard
Boston, Massachusetts

Carlton R. Gray, Program Director
Massachusetts Institute of Technology
Cambridge, Massachusetts

Norman C. Gray
Metropolitan District Commission
Boston, Massachusetts

John F. Haggerty, Associate Commissioner
Metropolitan District Commission
Boston, Massachusetts

Peter R. Harrington, Sanitary Engineer
Massachusetts Department of Public Health
600 Washington Street, Boston, Massachusetts

ATTENDEES (continued):

Jim Healey, Assistant to the Commissioner
Massachusetts Department of Natural Resources
100 Cambridge Street, Boston, Massachusetts

E. W. Holland, Principal Sanitary Engineer
Metropolitan District Commission
20 Somerset Street, Boston, Massachusetts

David R. Horsefield, Vice President,
Camp, Dresser & McKee, Inc.
One Center Plaza, Boston, Massachusetts

Barrett Hurwitz, U. S. Attorney's Office
Federal Building, Boston, Massachusetts

Frank Iebba, Student
Lowell Technological Institute
Textile Avenue, Lowell, Massachusetts

Russell A. Isaac, Senior Sanitary Engineer
Massachusetts Division of Water Pollution Control
100 Cambridge Street, Boston, Massachusetts

James R. Jones, Engineer, Construction Division
Metropolitan District Commission
20 Somerset Street, Boston, Massachusetts

W. E. Kaloupek, Captain, U. S. Navy
Boston Naval Shipyard, Boston, Massachusetts

Frederic R. Kellogg, Asst. U. S. Attorney
Justice Department
1107 Post Office and Courthouse
Boston, Massachusetts

John A. Kessler, Jr., Administrative Assistant
Metropolitan District Commission
Boston, Massachusetts

Kathleen Kilgore, Contributing Editor
Metro Boston Magazine
725 Boylston Street, Boston, Massachusetts

Peter Koff, Asst. Corporation Counsel
City of Boston Law Department
City Hall, Boston, Massachusetts

ATTENDEES (continued):

John J. Leahy, Jr., Management Specialist
Metropolitan District Commission
Environmental Affairs Secretariat
20 Somerset Street, Boston, Massachusetts

Louise Lewis, Co-Chairman, Boston Harbor Committee
Sierra Club
337 Newbury Street, Boston, Massachusetts

Dorothy Liveright
League of Women Voters of Boston
290 Commonwealth Avenue, Boston, Massachusetts

Sabin M. Lord, Jr.
Metropolitan Regional Engineer
Massachusetts Division of Water Pollution Control
100 Cambridge Street, Boston, Massachusetts

A. T. Lyman, Jr., Associate Commissioner
Metropolitan District Commission
Wilsondale Street, Dover, Massachusetts

Robert McCracken, Supervisory Sanitary Engineer
Division of Environmental Health
Massachusetts Department of Public Health
600 Washington Street, Boston, Massachusetts

Richard W. McManus, Reporter
The Christian Science Monitor
Boston, Massachusetts

Howard Nelson, Channel 7, Boston, Massachusetts

Steve Nevas, WBZ-TV, Boston, Massachusetts

Dorothy Newell, Reporter, The Patriot Ledger
13 Temple Street, Quincy, Massachusetts

Greta Nilsson, Massachusetts Audubon Society
Lincoln, Massachusetts

Vincent P. O'Brien, Associate Commissioner
Metropolitan District Commission
20 Somerset Street, Boston, Massachusetts

ATTENDEES (continued):

James A. O'Rourke, Division Engineer
Sewer Division, City of Boston Public Works Dept.
716 City Hall, Boston, Massachusetts

James A. Orphanos, Senior Sanitary Engineering Aide
Massachusetts Department of Public Health
600 Washington Street, Boston, Massachusetts

Nunzio L. Palladino, Head, Facilities Planning
Boston Naval Shipyard, Boston, Massachusetts

J. Thomas Parr, Senior Geophysicist
Massachusetts Institute of Technology
Draper Laboratory, M. S. #14
37 Cambridge Parkway, Cambridge, Massachusetts

Alvin Peirce, Senate President's Office
State House, Boston, Massachusetts

Max Rosenblatt, Associate Commissioner
Metropolitan District Commission
20 Somerset Street, Boston, Massachusetts

Lincoln W. Ryder, Project Engineer
Camp, Dresser & McKee
Boston, Massachusetts

Mrs. Nelson R. Saphir, Chairman
Save our Shores, Dorchester Bay-Boston Harbor & Islands Project
921 East Squantum Street, Squantum, Mass.

Harry F. Schmecht, Lt., U. S. Coast Guard
John F. Kennedy Federal Building
Boston, Massachusetts

Edward I. Selig, Executive Secretary
Council on Law Related Studies
1563 Massachusetts Avenue, Cambridge, Mass.

W. M. Spaulding, Jr., Deputy Regional Director
Bureau of Sport Fisheries & Wildlife, Region 5
U. S. Department of the Interior
U. S. Post Office and Courthouse
Boston, Massachusetts

ATTENDEES (continued):

F. R. Stevenson, Lt. Cdr., U. S. Navy
Navy Building, Boston, Massachusetts

Richard C. Sullivan
P. R. Health Education Coordination
Massachusetts Department of Environmental Health
600 Washington Street, Boston, Massachusetts

Mrs. William Bradford Trafford
Boston League of Women Voters
290 Commonwealth Avenue, Boston, Massachusetts

W. F. Tripp, Lt. (jg), U. S. Coast Guard
Captain of the Port, Boston
427 Commercial Street, Boston, Massachusetts

R. W. Thieme, Special Assistant for Enforcement
Environmental Protection Agency
Washington, D. C.

Roger L. Williams
Assistant to the Assistant Administrator for
Enforcement and General Counsel
Environmental Protection Agency
Washington, D. C.

Lester A. Sutton, Director
Air & Water Programs Division
Environmental Protection Agency, Region I
Boston, Massachusetts

Gerald W. McCall, Sanitary Biologist
Division of Environmental Health
Massachusetts Department of Public Health
Room 320, 600 Washington Street
Boston, Massachusetts

PROCEEDINGS

OPENING STATEMENT

BY

JOHN R. QUARLES, JR.

MR. QUARLES: The conference is open.

This third session of the conference in the matter of pollution of the navigable waters of Boston Harbor and its tributaries, involving the State of Massachusetts and the U. S. Environmental Protection Agency, is being held under the provisions of section 10 of the Federal Water Pollution Control Act.

The first session of the conference was held on May 20, 1968, and the second session was held on April 30, 1969.

Under the provisions of the Act, the Administrator of the Environmental Protection Agency is authorized to call a conference of this type when he finds that substantial economic injury results from the inability to market shellfish or shellfish products in interstate commerce because of pollution subject to abatement under the Federal Act and action of Federal, State, or local authorities.

The purpose of this conference session is to bring together the State water pollution control agency, representatives of the U. S. Environmental Protection Agency, and other interested parties to consider the recently completed report on the effects of sludge deposits on Boston Harbor, the progress of conference abatement programs. and other matters considered pertinent by the conferees.

Both the State and Federal governments have responsibilities in dealing with water pollution control problems. The Federal Water Pollution Control Act declares that the States have primary rights and responsibilities for taking action to abate and control pollution. Consistent with this, we are charged by law to encourage the States in these activities.

At the same time, the Administrator of the Environmental Protection Agency is charged by law with specific responsibilities in the field of water pollution control in connection with pollution of interstate and navigable waters. The Federal Water Pollution Control Act provides that pollution of interstate or navigable waters, whether the matter causing or contributing to the pollution is discharged directly into such waters or reaches such waters after discharge into a tributary, which endangers the health or welfare of any persons, shall be subject to abatement.

As specified in section 10 of the Federal Water Pollution Control Act, the Administrator has notified the official State water pollution control agency, which is the Massachusetts Department of Natural Resources, of this conference. The Massachusetts Department of Natural Resources will be represented by Mr. Brownell and Mr. McMahon, who are seated at my left.

The Federal conferee is Mr. Pahren who is the second to my right.

Mr. McGlennon, the Regional Administrator for the Environmental Protection Agency, and Mr. Murray Stein are also with me.

Mr. Newman from the New England River Basins Commission is to my extreme right.

I am going to pause at this moment. In order that we can get a complete and accurate record of the persons here at the head table together with their positions, I will ask each of the people at the table if he will identify himself and his position.

Arthur?

MR. BROWNELL: I am Arthur Brownell, the Commissioner of the Massachusetts Department of Natural Resources and Chairman of the Massachusetts Water Resources

Commission.

MR. McMAHON: My name is Thomas C. McMahon. I am the Director of the Division of Water Pollution Control under the control of Massachusetts Water Resources Commission in the Department of Natural Resources.

MR. STEIN: Murray Stein, Headquarters, Environmental Protection Agency, Chief Enforcement Officer for Water.

MR. PAHREN: I am Herbert Pahren, Director of the Division of Enforcement for the New England Region.

MR. McGLENNON: I am John McGlennon, New England Regional Administrator, Environmental Protection Agency.

MR. NEWMAN: Walter Newman, New England River Basins Commission.

MR. QUARLES: And my name is John R. Quarles, Jr. I am the Assistant Administrator for Enforcement and General Counsel of the Environmental Protection Agency in Washington, D. C., and the representative here today of Administrator William Ruckelshaus.

The parties to this conference are the official State water pollution control agency and the Environmental Protection Agency. Participation in this conference will be open to representatives and invitees of these agencies and such persons as inform me that they wish to present statements. However, only the representatives of the State water pollution control agency and the Environmental Protection Agency constitute the conferees.

A record and verbatim transcript of the conference is being made by Mr. McLaughlin. This is being made for the purpose of aiding us in preparing a summary and also for providing a complete record of what is said here.

We shall make copies of the summary and transcript available to the Massachusetts Department of Natural Resources. We have generally found that for the purpose of maintaining relationships within the States, the people who wish summaries and transcripts should request them through their State agency rather than come directly to the Federal Government. The reason for this is simply that, when the conference has been concluded, we would prefer people who are interested in the problem to follow the normal relationships in dealing with the State rather than the Federal Government.

I would suggest that all speakers and participants other than the conferees making statements come to the lectern and identify themselves for purposes of the record.

The initial part of the conference this morning will be the presentation of a report that represents a summary of the conditions pertinent to this matter as developed in this case on a joint basis by the personnel of the United States Environmental Protection Agency and the Massachusetts Department of Natural Resources. Copies of this record I believe are available for your use.

The presentation will be made on a cooperative basis.

I will now ask Mr. Pahren, the Federal conferee, to assume responsibility for initiating that presentation.

MR. PAHREN: Thank you, Mr. Quarles.

As you indicated, the report will be presented both by the EPA representative and a representative of the Massachusetts Department of Natural Resources. We will read only a portion of the report. However, with your permission, we would like the entire report entered into the record as if read.

MR. QUARLES: Without objection, that will be done.

MR. PAHREN: Mr. Myron Knudson, who is the Deputy Director of the Division of Surveillance and Analysis, will start off our presentation.

STATEMENT OF

MYRON O. KNUDSON

DEPUTY DIRECTOR

DIVISION OF SURVEILLANCE AND ANALYSIS

REGION I, ENVIRONMENTAL PROTECTION AGENCY

MR. KNUDSON: My name is Myron O. Knudson, from the Surveillance and Analysis Division, Region I, which is the New England Region, Environmental Protection Agency.

The background for this report is as follows:

On May 20, 1968, the Secretary of the Interior held the first session of the conference in the matter of pollution of the navigable waters of Boston Harbor and its tributaries in Massachusetts, involving the Commonwealth of Massachusetts and the Department of the Interior, under the provisions of section 10 of the Federal Water Pollution Control Act. The conference was initiated by the Secretary in accordance with his finding that substantial economic injury results from the inability to market shellfish products in interstate commerce because of pollution and the action of Federal, State, or local authorities.

Conclusions and recommendations approved by the Secretary of the Interior of the first session of the conference are as follows:

1. The waters of Boston Harbor overlying some shellfish beds are polluted.

2. The pollution results from the discharge of untreated or inadequately treated wastes from municipalities, industries, combined sewer overflows, tributary streams, debris and refuse, watercraft wastes, and Federal installations, including Boston Naval Shipyard, Navy ships berthed in Boston Harbor, the Coast Guard's Base Boston, and Nike Ajax Site B-36 (Hull). As a result, these waters are polluted by bacteria, suspended solids, nutrients, and organic matter causing an oxygen demand.

3. As a result of the existing or potential pollution of these waters, the Commonwealth of Massachusetts, under the cooperative agreements governing the National Shellfish Sanitation Program, has completely closed some areas for the direct marketing of shellfish and restricted additional areas so that the shellfish must be processed through a depuration plant.

4. These closures have caused substantial economic injury resulting from the inability to market shellfish or shellfish products in interstate commerce.*

(* Commissioner Yasi took procedural exception to this conclusion by the Federal conferee.)

5. The pollution of these navigable waters is subject to abatement under the provisions of section 10 of the Federal Water Pollution Control Act, as amended.*

6. In some areas, the pollution of these waters has resulted in an unsightly appearance, the excessive growth of aquatic plants, objectionable odors, sludge deposits, and limited use of the waters for recreational bathing, boating, and aesthetic enjoyment.

7. The State agency has taken appropriate action to date under State law to abate pollution. The delays in abating the pollution are due to the very complicated nature of the problem.

8. The conferees agreed that a technical committee be appointed to be chaired by the Chairman of the Massachusetts Department of Natural Resources, the Federal Chairman of the New England River Basins Commission, and the Northeast Regional Director of the Federal Water Pollution Control Administration. The committee shall be empowered to appoint subcommittees and expand its membership. The committee will make an evaluation of the following and report to the conferees at 6-month intervals.

---

* Commissioner Yasi took procedural exception to this conclusion by the Federal conferee.

The scope of such evaluation will include but not be limited to:

a. A status report of pollution abatement required by the Division of Water Pollution Control for all municipal and industrial contributors listed in the Massachusetts standards of water quality, including Federal installations as well.

b. A report of the attainment of Boston Harbor water classifications by the several municipal and industrial pollution sources.

c. Delineation of an overall plan to control the dumping of garbage or refuse along the shores and in the harbor.

d. A program to improve dump sites and correct the problem of sunken vessels, deteriorating piers, and debris.

e. Investigation of suitable Federal and State laws to control oil pollution and wastes from watercraft.

f. Study of a deep tunnel proposal from a water quality and use standpoint as well as consideration of the most feasible means of financing such a project.

g. Plans to assist Federal authorities in the implementation of treatment works for Federal installations.

9. Federal installations will be required to meet the time schedule of Massachusetts water quality standards. Nike Ajax Site B-36 (Hull) will be required to make a determination in 6 months as to whether it will join the municipal system or provide its own installation and have its remedial system or facility put in by 18 months from the date of this conference.

The Coast Guard's Deer Island Light Station will be given 6 months to put in a temporary facility. The Coast Guard's Base Boston Station should complete its remedial facilities by May 1970. Base Boston vessels in port are to observe May 1970 as the completion date for their remedial facilities and for a sewerline to collect their sanitary wastes. The Naval Shipyard should have its remedial facility for collection and control of its wastes from machine shop and tank cleaning operations completed by July 1969.

10. The conference may be reconvened upon the call of the chairman.

Conclusions and recommendations approved by the Secretary of the Interior following the second session of the conference held on April 30, 1969 are as follows:

1. That the implementation plans set forth as follows by the Commonwealth of Massachusetts for the

various municipalities and industries be approved:

Source	Type of Treatment Needed	Date of Completion
Deer Island wastewater treatment facility	Additional chlorination capacity	Immediately
Nut Island wastewater treatment facility	Additional chlorination capacity	Immediately
MDC Winthrop sewage bypass	Connect to Deer Island facility	July 1969
Hull	Secondary treatment facility	March 1971
Tidegates in the city of Boston	Repair of gates	May 1971
City of Boston's Calf Pasture Pumping Station and Moon Island facility	Connect to MDC sewerage system	March 1972
Monsanto-Everett	Connect to MDC sewerage system	October 1969

2. That a consulting engineering firm be engaged by the Commonwealth of Massachusetts to:

a. Evaluate the tidal and current patterns and the dispersion characteristics of Boston Harbor, particularly as it affects the Deer Island and Nut Island treatment plants. The evaluation will include the utilization of mathematical modeling techniques directed to the determination of mixing zones, and recommendations for sludge disposal and chlorination practices. This report shall be completed by the winter of 1970-1971 and an implementation schedule incorporating the approved recommendations shall be developed directly thereafter.

b. Provide an evaluation and recommendation as to the most practical and economical solution to the overall Boston Harbor problem considering the effects of tributary streams and combined sewer overflows.

c. As a further step toward advancing the Boston Harbor water quality control program, the Commonwealth of Massachusetts adopt a marina control law and a boat pollution control law for the protection of inland and coastal marine waters.

d. That a comprehensive water quality management plan be completed for the Boston Harbor drainage area by the New England River Basins Commission in cooperation with the State and Federal agencies concerned.

e. That all pollution abatement measures should be taken to control the pollution from Federal installations within the schedule outlined below:

	Installation	Recommendation
1.	Nike Ajax Site B-36	Install sand filter by November 1969.
2.	Deer Island Light Station	Automate by May 1970.
3.	Base Boston Coast Guard Two urinals on pier and vessels in port	Begin construction of sewerline to collect these wastes by May 1970.
4.	Naval Shipyard	Implement plan to eliminate the discharges of all industrial wastes to Boston Harbor by November 1969.
5.	Naval Shipyard Toilets in Piers 4 and 6	Complete program to permanently connect to Boston sewer system by May 1970.
6.	Drydocks - Naval Shipyard and Naval Annex	Construct facilities to eliminate sewage discharges by June 1970.
7.	Navy ships berthed in Boston Harbor	Continue testing program to find an acceptable method of treating wastes from vessels.

The Massachusetts conferees made the following recommendations, with the Federal conferee abstaining:

In noting the detrimental effect of Federal construction grant cutbacks in appropriations on State water pollution control programs, the conferees of the Commonwealth of Massachusetts urge that the Federal Water Pollution Control Administration and the Secretary of the Interior recommend to the Congress of the United States the adoption of a fiscal program consistent with the implementation programs adopted by the States throughout the Nation.

It is further recommended that legislative amendments to the Federal Water Pollution Control Act do not vary the present grant percentages to communities for construction of waste treatment facilities or if alternative means of financing are introduced, the alternative financing measures are the equivalent of the present percentages specified in the Act.

These conferees would also urge the passage of a separate appropriation to finance the reimbursable clause of the Federal Act to repay States that have or will prefinance the eligible Federal portions of treatment facilities in anticipation of future Federal reimbursements.

Table 1 is a summary table giving the status of the recommended implementation plans as set forth by the Commonwealth of Massachusetts. Detailed explanations of the status of each of the recommendations, in particular those incomplete programs, are given in the following sections of the report.

Table 2 gives the status of the pollution abatement measures at Federal installations.

(Tables 1 and 2 follow.)

TABLE 1
SUMMARY OF STATUS OF 2ND SESSION
ENFORCEMENT CONFERENCE RECOMMENDED IMPLEMENTATION PLANS

Source	Type of Treatment Needed	Date of Completion	Status as of July 1, 1971
Deer Island Wastewater Treatment Facility	Additional chlorination capacity	Immediately	Completed
Nut Island Wastewater Treatment Facility	Additional chlorination capacity	Immediately	Completed
MDC Winthrop Sewage Bypass	Connect to Deer Island Facility	July 1969	Completed
Hull	Secondary treatment facility	March 1971	Not completed
Tidegates in the city of Boston	Repair of gates	May 1971	Not completed
City of Boston's Calf Pasture Pumping Station and Moon Island Facility	Connect to MDC sewerage system	March 1972	*
Monsanto-Everett	Connect to MDC sewerage system	October 1969	Completed

*Alternate plans are being developed for treatment of this pollution source.

July 1, 1971

TABLE 2
BOSTON HARBOR AND TRIBUTARIES
STATUS OF COMPLIANCE
FEDERAL INSTALLATIONS

Location	Finish Date	Remarks
Nike Ajax Site B-36 Boston	11/69**	
Deer Island Light Station, Boston	5/70**	Completed September 1971
Coast Guard, Boston	3/70*	Under construction.***
Naval Shipyard, Boston	11/69**	Completed July 1970.
Naval Shipyard Piers 4 and 6, Boston	5/70**	Completed July 1970.
Naval Shipyard and Annex Dry Docks, Boston	6/70**	Dry dock #2 completed and operational. Dry dock #3 completed.
Navy ships in Boston Harbor	--	Electroylsis units and holding tanks are presently being installed as part of their routine five-year overhaul.

*Not on schedule
**Completed
***This refers only to the ship collection system.

MR. KNUDSON: At this time I would like to turn it over to Al Ferullo of the Massachusetts Division of Water Pollution Control, who will continue the report.

STATEMENT OF

ALFRED F. FERULLO

ENVIRONMENTAL BIOENGINEER

DIVISION OF WATER POLLUTION CONTROL

COMMONWEALTH OF MASSACHUSETTS

BOSTON, MASSACHUSETTS

MR. FERULLO: My name is Alfred F. Ferullo, Massachusetts Division of Water Pollution Control.

CURRENT STATUS OF ENFORCEMENT CONFERENCE RECOMMENDATIONS:

Town of Hull

At the second session of the conference, the conferees agreed that the town of Hull should construct a secondary wastewater treatment facility with disinfection. The implementation schedule for Hull's treatment plant is:

Federal Enforcement

	Conference Dates	State Dates	Status
Preliminary plans submission	--	October 1969	Compliance
Final plans submission	--	June 1972	
Funding completed	--	February 1970	Compliance
Start of construction	--	September 1972	
Facility in operation	March 1971	December 1973	

The Federal schedule was submitted by the Commonwealth of Massachusetts at the second-session enforcement conference and approved by the Secretary of the Interior. The town of Hull did not comply with this implementation plan, and, therefore, the Massachusetts Division of Water Pollution Control issued a new schedule to the town under formal Division orders. Hull is currently in the process of selecting a consultant engineering firm to prepare final engineering plans, and the town believes it will be able to meet the June 1972 State date for submission of these plans.

Tidegates in the Boston Main Drainage System

In the metropolitan Boston area there are in excess of 100 stormwater drainage outlets to tidewaters, while in the Boston main drainage system there are approximately 72 outlet structures with about 200 individual tidegates appurtenant to these outlets. The second session of the conference pointed out that a large number of tidegates appurtenant to the stormwater drainage outlets within the Boston main drainage system were inoperative allowing the intrusion of salt water into the sewerage system. This salt water intrusion increases the flow to the Deer Island wastewater treatment plant and reduces the overall efficiency of this primary waste treatment facility.

As of July 19, 1971, there were 22 combined sewer outlets in the Boston main drainage system which were operational, six under construction, two proposed for construction, and 42 under investigation. This information was supplied by the Metropolitan District Commission.

The Massachusetts Attorney General, in a letter of August 21, 1969, to the Chairman, Water Resources Commission, stated that it was his opinion that the responsibility for rehabilitation of the Boston main drainage system tidegates rests with the Metropolitan District Commission. The MDC is proceeding slowly with the repairs, having repaired about seven outlets completely since February 1971, and has not met the May 1971 date of completion as recommended by the enforcement conference.

Tidegates outside the Boston Main Drainage System

In the Charlestown and East Boston sections, which are not a part of the Boston main drainage system, there are 22 combined sewer outlets to tidewaters. Also outside the system, but within the metropolitan region, are Cambridge, Chelsea, and Somerville. The tidegates, regulators, stoplogs, and other flow control devices in these communities must be maintained in operating condition. Programs for inspection and rehabilitation of these systems should be accomplished by these communities as soon as possible.

Boston's Calf Pasture Pumping Station and Moon Island Facility

The Moon Island sewerage holding facility now receives sewage from only the Squantum section of Quincy. About 1 to 2 million gallons per day of sewage is currently discharged on outgoing tides after chlorination. There is a project underway by the MDC to divert the Squantum flows to the Nut Island facility which is scheduled for completion by December 1971.

The Calf Pasture pumping station and the Moon Island holding facility will be completely abandoned in conjunction with a proposed city of Boston-MDC project to divert combined sewage overflows from Carson Beach and L Street in South Boston for screening, settling, chlorination, and discharge to reserved channel. The appropriation for this project is contained in House Bill 167 which was reported to the Massachusetts Senate Ways and Means Committee on August 31, 1971. The estimated cost for the project is in excess of $33 million.

An alternative proposal contained in House Bill 168 is the construction of a chlorination-detention facility at Calf Pasture to provide treatment of combined sewer overflows when they occur. This bill was also reported to the Senate Ways and Means Committee on August 31, 1971.

Cambridge Combined Sewers

The city of Cambridge has an extensive combined sewerage system. Frequent overflows occur to the Charles River. Overflows also affect Alewife Brook (Mystic Basin) and Boston Inner Harbor.

In 1968, a consultant firm recommended that Cambridge immediately initiate a 5-year program of construction to reduce combined flows to the MDC system to within the design capacities of that system with a corresponding reduction in sanitary waste overflow to the Charles River and Alewife Brook. A second phase was also recommended -- a long-term program of construction for total separation of all existing combined sewer areas.

The Commonwealth of Massachusetts placed Cambridge on an implementation schedule to carry out the recommendations. The schedule for phase I is as follows:

Project	To be completed
I	September 1972
II	September 1973
III	September 1974
IV	September 1975
V	September 1976

Boston Combined Sewers

In 1967 a consultant for the city of Boston recommended that Boston rehabilitate and expand its existing sewer system, which included repairs to tidegates and regulators. Many of Boston's sewers are overloaded and in need of repair. The city has not implemented these recommendations.

Somerville and Chelsea Combined Sewers

The cities of Somerville and Chelsea have combined systems. Overflows from these systems affect the quality of Alewife Brook, Mystic, and Chelsea Rivers and the Boston Inner Harbor. It is necessary to engage a consulting firm to investigate the adequacy of their sewer systems and make recommendations to rehabilitate the system.

Boston Marginal Interceptor and Pumping Station

The MDC plans, in conjunction with the proposed Charles River Dam, to extend the Boston marginal conduit to a point below the proposed dam, to intercept overflows that now exist between the location of the present dam and the proposed dam from Cambridge, Somerville, and Boston, and to construct a pumping station so that the flows in the marginal conduit can be discharged to the tidewater at all tides and provide partial treatment to the overflow.

The Boston marginal conduit intercepts combined sewage from the West Side Interceptor and Stony Brook system which are city of Boston sewers. At the present time, when a rainfall occurs during high tides, all combined sewage is discharged to the Charles River Basin. The proposed project will reduce overflows to the Charles River, but there may be frequent discharges of combined sewage to the Charles River Basin and the Back Bay Fens area from both the MDC Boston marginal conduit and the city of Boston sewers.

Massachusetts actions regarding the Boston Harbor pollution problems

In accordance with the recommendations of the second session of the Boston Harbor conference, as presented in the introduction of this report, the Massachusetts Division of Water Pollution Control engaged the services of Hydroscience, Inc., of Westwood, New Jersey, to evaluate the Boston Harbor pollution problem, in particular as it relates to the Deer Island and Nut Island waste treatment plants and the effects of tributary streams and combined sewer overflows.

The Hydroscience report has been completed. After consideration of this report, the director, in a letter of June 4, 1971, informed the Commissioner of the MDC that the report evidences inadequate sludge disposal practices at the Deer Island and Nut Island waste treatment facilities. Based upon violation of water quality standards for class SB waters, he recommends the MDC undertake to have an engineering study prepared relative to alternative sludge disposal methods at both the Deer Island and Nut Island plants.

EPA personnel collected data on the sludge and sewage effluent from the Deer Island and Nut Island facilities. These data and discussion are presented in the next section of the report. Based on this data and the Hydroscience data, the EPA wrote to the Commissioner, MDC, on July 19, 1971, to support the position of the Division of Water Pollution Control.

An additional problem at the Nut Island wastewater treatment plant is that the plant is currently operating under overloaded conditions. The Fifty-first Annual Report of the Metropolitan District Commission, Sewerage Division, for the fiscal year ending June 30, 1970, reports that the Nut Island plant received an average flow of 12.79 million gallons per day above the average design flow of 112.0 mgd. Operation under overloaded conditions decreases the efficiency of the treatment plant, pointing out the need for increasing the capacity of the plant to allow the treatment intended by the design. The water quality of the receiving waters should be examined periodically to determine whether or not the degree of treatment should be increased.

Sampling at Deer Island and Nut Island Treatment Facilities

On March 16 and 31, 1971, EPA personnel collected samples of the Deer Island and Nut Island sludge and sewage effluents. The results of the analyses of these samples are presented in Tables 3, 4, and 5.

It is indicated that the discharge of digested sludge and treated sewage from the waste treatment plants violates the following water quality criteria for class SB waters:

	Item	Water Quality Criteria
1.	Sludge deposits-oils-grease-solid refuse	None allowable.
2.	Coliform bacteria per 100 ml	Not to exceed a median value of 700 and not more than 2300 in more than 10 percent of the samples during any monthly sampling period.
3.	Chemical constituents (metals)	None in concentrations or combinations which would be harmful to human, animal or aquatic life or which would make the waters unsafe or unsuitable for fish or shellfish or their propagation, impair the palatability of same, or impair the water for any other usage.

Class SB waters should be suitable for bathing and recreation purposes, including water contact sports, industrial cooling, excellent fish habitat, good aesthetic value, and suitable for certain shellfisheries with depuration. It is evident that the existing sludge discharges directly interfere with these assigned uses. Figure 1 shows the limits of the SB classification for Boston Harbor.

The results of the metals scan analysis on the sludge sample from the Nut Island sludge digester reveals concentrations of cooper, cadmium, lead, zinc, nickel, and chromium. Sludge samples analyzed for mercury revealed concentrations of that metal also. Concentrations of the metals as found could be detrimental to the well being of aquatic organisms, particularly fish food organisms, and other aquatic life. There is also indicated another potential problem from the discharge of sludge with these concentrations of metals. The sludge is discharged into the President Roads area of Boston Harbor during the first 3 hours of ebbtide.

Hydroscience, Inc. reports in the "Final Report, Development of Water Quality Model of Boston Harbor," July 1971, that the present practice of discharging sludge for the first 3 hours of ebbing tide results in the deposition of approximately 15 to 20 percent of the sewage sludge solids in the portion of the harbor west of Deer Island. Concentrations of mercury, lead, and zinc, as found, exceed those acceptable in the EPA criteria for dredge spoil disposal.

Flow data provided by the Nut Island treatment plant operator on March 31, 1971 indicates the plant was operating under overloaded conditions.

At the Deer Island facility the sludge is discharged through the sewage effluent line where there is about a 300 to 1 dilution of the sludge with the chlorinated sewage effluent. Although there is a substantial reduction of coliform organisms in the discharged sludge, disinfection during this period is, nevertheless, inadequate.

Marina Control and Watercraft Pollution Control Laws

The Massachusetts Legislature approved, on August 18, 1970, chapter 693 of the Acts of 1970, section 2, amending chapter 91 of the General Laws, which pertains to the licensing of marinas. In general, the law stipulates that licenses to operate marinas shall not be granted unless adequate sanitary waste collection, treatment, and disposal facilities are provided, adequate dockside toilet facilities are provided for the occupants of watercraft, and adequate trash receptacles are provided for litter and refuse. This law will go into effect on May 15, 1972.

The Division of Water Pollution Control has held public meetings for approval of the proposed rules and regulations for the control and prevention of sewage and other waste material from watercraft. The next step is to file the proposed rules and regulations with the Secretary of State for presentation to the State Legislature. If approved, the law will go into effect on May 15, 1972. A copy of the existing law is given in Appendix A.

BOSTON HARBOR
SAMPLES FROM METROPOLITAN DISTRICT COMMISSION SEWERAGE SYSTEM
LOCATION OF SAMPLING STATIONS

DID-E	Deer Island sludge effluent sampling pipe No. 5 from sludge storage tank
DIE-1	Deer Island sewage effluent collection tank at end of sedimentation tank effluent launder after chlorination
NID-E	Nut Island sludge effluent sampling pipe No. 7 from sludge storage tank (usedto be digester No. 3)
NIE-1	Nut Island sewage effluent sampling port in effluent line under laboratory after chlorination
NIB-4	Nut Island benthal sediment northeast of Long Island at Buoy "C-5"

TABLE 3

BOSTON HARBOR, MASSACHUSETTS
CHEMICAL LABORATORY ANALYSIS RESULTS
OF
SAMPLES FROM METROPOLITAN DISTRICT COMMISSION SEWERAGE SYSTEM

					Wet Wt. Hg	Dry Wt. Hg	Coliform/100 ml		
Source	Lab #	Station	Date	Time	ug/l	mg/kg	Total	Fecal	Salmonella
Deer Island digester #2 sludge	23923	MDC-1	3/16/71	1300		2.0±0.6	24,000,000	360,000	positive
Deer Island ~~sludge~~ chlorinated plant effluent	23924	MDC-2	3/16/71	1315	0.6				positive
Nut Island* digester Tap 7A sludge	23925	MDC-3	3/16/71	1030		12.31±2.3	31,000,000	1,000,000	positive
Nut Island ~~sludge~~ chlorinated plant effluent	23926	MDC-4	3/16/71	1035	0.5				positive

*Metal Scan Analysis was performed on this sample on April 16, 1971.
See attached sheet for results.

TABLE 3 (Co[illegible]nued)
BOSTON HARBOR, MASSACH[illegible]TTS
CHEMICAL LABORATORY ANALYSI[illegible]ESULTS
OF
SAMPLES FROM METROPOLITAN DISTRICT COMMISSION SEWERAGE SYSTEM

Source	Lab #	Station	Date	Time	Oil & Grease mg/l	COD mg/l	Organic N mg/l	Total Residue Total mg/l	Total Residue Fixed mg/l	Total Residue Volatile mg/l
Deer Island sludge effluent	27101	DID-E	3/31/71	0945	2193	46,624	524	58,258	30,908	27,350
Deer Island sewage effluent	27102	DIE-1	3/31/71	1005	28					
Nut Island sludge effluent	27103	NID-E	3/31/71	1330	124	16,920	75	6,486	3,437	3,049
Nut Island sewage effluent	27104	NIE-1	3/31/71	1340	43					
Nut Island benthal sediment	27122	NIB-4	5/18/71	1450	803 mg/kg	35,790	335	624,215	597,889	26,317

Source	Lab #	Station	Date	Time	Total Nonfilterable Residue Total mg/l	Total Nonfilterable Residue Fixed mg/l	Total Nonfilterable Residue Volatile mg/l	Coliform/100 ml Total	Coliform/100 ml Fecal
Deer Island sludge effluent	27101	DID-E	3/31/71	0945	*				
Deer Island sewage effluent	27102	DIE-1	3/31/71	1005	85**	8	5	210,000,000***	2,300,000***
Nut Island sludge effluent	27103	NID-E	3/31/71	1330	3,486	1,899	1,587		
Nut Island sewage effluent	27104	NIE-1	3/31/71	1340	116**	5	28	72,000,000	850,000
Nut Island benthal sediment	27122	NIB-4	5/18/71	1450					

*Because of the solid load, it was not possible to obtain usable data.
**These values were submitted to the Division of Water Pollution Control by the MDC.
***These values are reduced substantially at the time of discharge due to mixture of the sludge with the treated sewage effluent.

METALS SCAN

TABLE 4
NUT ISLAND SLUDGE FROM SLUDGE DIGESTER

Analyzed April 16, 1971, by NFIC

SAMPLE NUMBERS	5978*
Be	6
Ti	800
V	< 80
Cr	4000
Mn	4000
Fe	80000
Co	100
Ni	1000
Cu	12000
Zn	14000
As	< 400
Sr	4000
Zr	60
Mo	120
Cd	160
Sn	< 120
Sb	< 400
Te	< 800
Ba	8000
Sm	600
Tl	120
Pb	8000
Bi	400

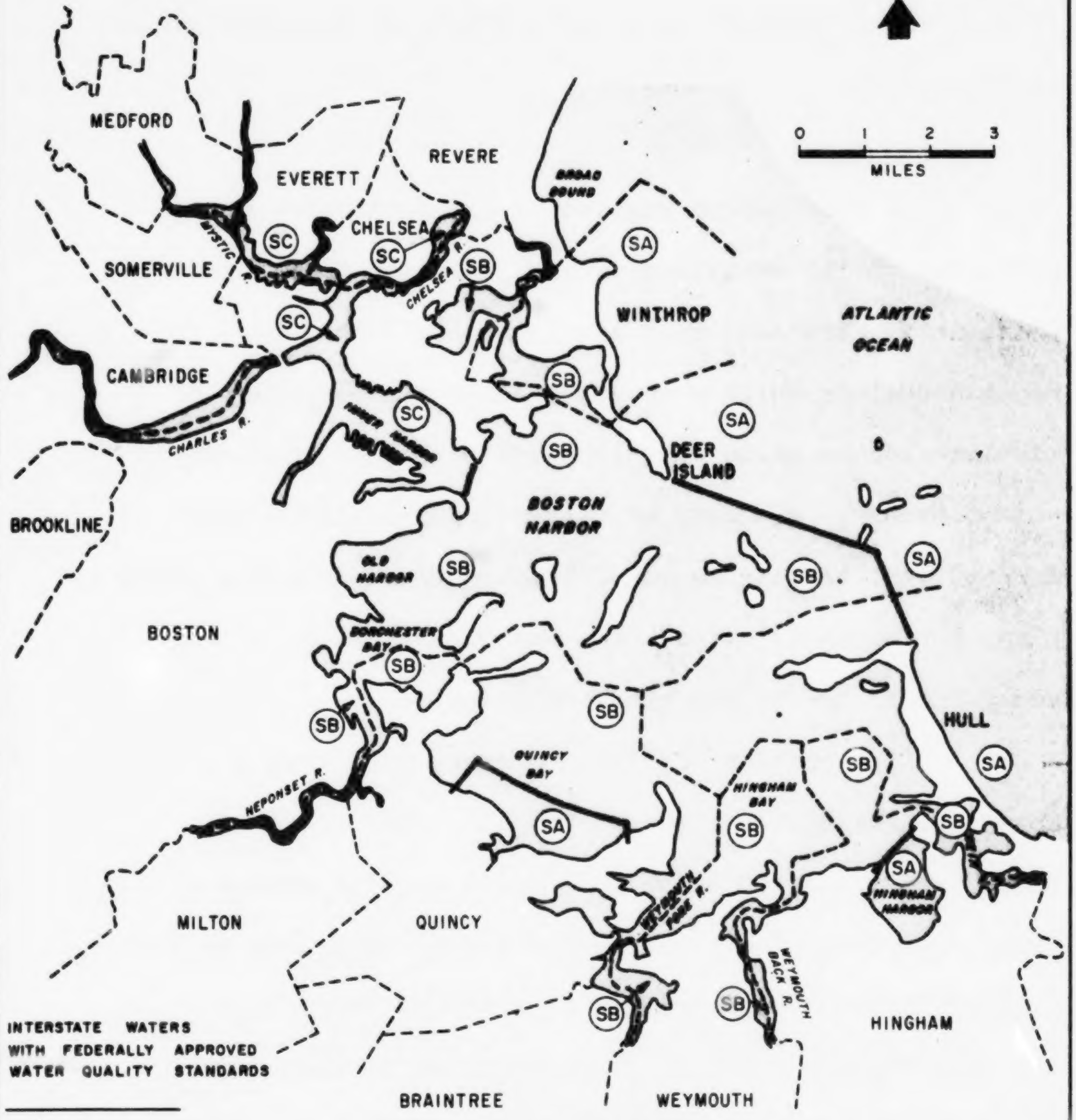
Concentration = ug/l (Wt. weights)

*NEBO No. 23925

TABLE 5
BOSTON HARBOR
LOADING ON MARCH 31, 1971

	Flow mgd	Oil & Grease lbs	COD lbs	Organic-N lbs	Total Solids lbs	Nonfilterable Residue lbs
Deer Island						
Sludge effluent	0.204	3,570	79,300	890	98,700	
Sewage effluent	336	78,400				238,000*
Total		81,970				
Nut Island						
Sludge effluent	0.288	300	40,900	181	15,700	8,350
Sewage effluent	131.9	47,700				128,000*
Total		48,000				44,950

*These values were determined using sample data submitted to the State by the MDC.


0 1 2 3
MILES
MEDFORD
EVERETT
REVERE
BROAD SOUND
MYSTIC R.
CHELSEA
CHELSEA R.
SOMERVILLE
CAMBRIDGE
CHARLES R.
WINTHROP
ATLANTIC OCEAN
DEER ISLAND
BOSTON HARBOR
BROOKLINE
OLD HARBOR
BOSTON
DORCHESTER BAY
QUINCY BAY
HULL
HINGHAM BAY
NEPONSET R.
MILTON
QUINCY
WEYMOUTH FORE R.
WEYMOUTH BACK R.
HINGHAM HARBOR
HINGHAM
BRAINTREE
WEYMOUTH
SC
SC
SC
SC
SB
SA
SB
SA
SB
SB
SB
SA
SB
SB
SB
SB
SA
SB
SA
SB
SB
INTERSTATE WATERS
WITH FEDERALLY APPROVED
WATER QUALITY STANDARDS

†Tidal Portions of
Boston Harbor

WATER QUALITY STANDARDS
ADOPTED BY
COMMONWEALTH OF MASSACHUSETTS
WATER RESOURCES COMMISSION

BOSTON HARBOR
CLASSIFICATION

WATER QUALITY STANDARDS - Ⓐ Ⓑ Ⓒ Ⓓ (SA) (SB) (SC)
— CHANGE OF CLASSIFICATION

FIGURE 1

MR. FERULLO: I would now like to read the summary of this report.

SUMMARY

At the second session of the conference on pollution of the navigable waters of Boston Harbor and its tributaries, the conferees agreed upon a number of recommendations which were approved by the Secretary of the Interior to alleviate the water pollution problems in Boston Harbor. A number of these recommendations were carried out; however, some of the recommended implementation plans for waste treatment have not been carried out according to the agreed-upon schedules.

The complete conference recommendations are contained on pages 1 through 7 of this report. The major pollution problem which remains as an incomplete program is that of the rehabilitation of tidegates in the city of Boston. Continuing salt water intrusion into the MDC sewerage system from inoperative tidegates decreases the efficiency of the waste treatment facilities.

The Commonwealth of Massachusetts Division of Water Pollution Control, with the recommendation of the Secretary of the Interior, engaged an engineering firm to study the Boston Harbor pollution problem as it realtes to the Metropolitan District Commission (MDC) wastewater treatment facilities at Deer Island and Nut Island. Results of this study indicate the sludge disposal practices at these facilities are not suitable to meet water quality standards. Alternate methods of sludge disposal by the MDC are required to increase the overall efficiency of the treatment plants and ensure compliance with water quality standards.

There has been considerable progress by the Federal Government, the Commonwealth of Massachusetts, MDC, and communities in the metropolitan area toward alleviating the water quality problems of Boston Harbor. Nevertheless, a great deal more needs to be accomplished in programs and legislation for pollution abatement.

Mr. Knudson now will read the conclusions and recommendations.

FURTHER STATEMENT OF

MYRON O. KNUDSON

MR. KNUDSON: The conclusions and recommendations of this joint report are as follows:

CONCLUSIONS

1. The town of Hull is not complying with the Federal enforcement conference implementation schedule for completion of a secondary sewage treatment plant. However, it is following the State implementation schedule

which calls for completion of the facility by December 1973 which is 2 years and 9 months later than the Federal schedule.

2. Although progress has been made, the Metropolitan District Commission has not complied with the Federal enforcement conference schedule for rehabilitation of the Boston main drainage system tidegates by May 1971.

3. There are a number of tidegates outside the Boston main drainage system, within communities served by the Metropolitan District Commission sewerage system, which are not included in the MDC rehabilitation program. There is salt water intrusion into the metropolitan system from these tidegates.

4. The discharge of chlorinated raw sewage from the Moon Island holding facility should be eliminated as soon as possible. The plans for abandoning the Moon Island facility and Boston's Calf Pasture pumping station along with diversion of combined sewer overflows from Carson Beach and L Street in South Boston will contribute significantly to the improvement of water quality in the Dorchester Bay portion of Boston Harbor. Appropriation of funds for this project is contained in House Bill 167 now before the Massachusetts Legislature. An alternative

proposal contained in House Bill 168 is the construction of a chlorination-detention facility at Calf Pasture to provide treatment of combined sewer overflows when they occur.

5. The Commonwealth of Massachusetts, Division of Water Pollution Control, has determined that the sludge disposal practices at the Deer Island and Nut Island treatment plants violate class SB water quality criteria. Alternative sludge disposal methods must be developed.

6. The Nut Island wastewater treatment facility is operating under overloaded conditions. Expansion of the plant or alternate measures are, therefore, necessary.

7. The Massachusetts Legislature has passed a law providing for the licensing of marinas to ensure adequate waste receiving and disposal facilities for watercraft and their passengers at all marinas. To complement this statute there are proposed regulations to control the discharge of wastes from watercraft which are expected to be made law this fall. These laws and regulations should be adequate for controlling water pollution from watercraft.

8. The New England River Basins Commission, through the Boston Harbor Water Quality Management Coordinating Group, is progressing toward development of

a long-term plan to provide for water quality in Boston Harbor which will meet established water quality standards and will support all legitimate water uses.

9. Time schedules were recommended by the conferees and were approved by the Secretary of the Interior for correcting pollution from Federal facilities discharging to Boston Harbor.

RECOMMENDATIONS

It is recommended that:

1. The town of Hull continue its existing program toward completion of a secondary wastewater treatment plant.

2. The Metropolitan District Commission complete the rehabilitation of all tidegates, regulators, stoplogs, and other control devices in the Boston main drainage system by May 1972.

3. The cities of Boston, Cambridge, Chelsea, and Somerville be ordered by the Massachusetts Division of Water Pollution Control to repair as necessary, operate, and maintain all combined sewer overflow structures appurtenant to the metropolitan sewerage system, not later than December 1, 1971. This work shall be completed by December 1973.

4. The Metropolitan District Commission complete the diversion of Squantum sewage to Nut Island by

December 1971. It is recommended that plans for the abandonment of the Calf Pasture pumping station and the Moon Island sewerage holding facility be implemented in 1972.

5. The Commonwealth of Massachusetts, Division of Water Pollution Control, issue an order to the Metropolitan District Commission to provide an implementation schedule for completion of a feasibility report by June 1972 relative to alternative methods of sludge disposal at the Deer Island and Nut Island wastewater treatment facilities. This report should be prepared by a competent research firm that has the capability to evaluate new methods of sludge disposal. Upon completion of the feasibility report, an implementation schedule be established for the construction of necessary facilities.

6. The Metropolitan District Commission complete an engineering report by September 1972 relative to future needs for the entire MDC sewerage system, including the Nut Island and Deer Island treatment facilities. Specific consideration should be given to the feasibility of expanding Nut Island or building wastewater treatment plants at other locations to reduce flows to Nut Island.

7. That the Metropolitan District Commission strictly enforce its existing regulations in order to

abate the pollution resulting from the substantial quantity of toxic materials being discharged to the MDC sewerage system and then to Boston Harbor.

8. In order to reduce the frequency of discharges from the Boston combined sewers into the Charles River Basin to at least once in 5 years, a project must be devised by the Metropolitan District Commission and the city of Boston which will go beyond the project presently contemplated to reduce overflows from the Boston marginal conduit and its related systems (the West Side interceptor and Stony Brook sewers) to a level consistent with other Charles River combined sewer abatement projects. Both the MDC and city of Boston should develop plans, within their own areas of responsibility, toward the ultimate goal of reducing the combined sewer overflows into the Charles River Basin.

9. The cities of Somerville and Chelsea hire consultants to investigate the adequacy of their sewer systems and to make recommendations to rehabilitate the systems and to abate pollution from combined sewer overflows. Upon completion of these studies, implementation schedules be established by the Massachusetts Division of Water Pollution Control to construct the necessary pollution abatement facilities.

10. The city of Cambridge meet the implementation schedule established by the Commonwealth of Massachusetts (for separation of its combined sewer system) and start action not later than 6 months hereafter.

11. The city of Boston begin to implement the recommendations of its consultants to rehabilitate and expand the existing sewer system, and that a schedule for such work be developed by the city of Boston for the consideration and approval of the Massachusetts Division of Water Pollution Control.

12. The Massachusetts Division of Water Pollution Control establish mixing zones for the discharges from the Nut Island and Deer Island treatment facilities, and that the description of mixing zones be submitted to the Environmental Protection Agency for approval by November 30, 1971.

13. A program should be initiated for routinely removing small amounts of floating debris, scum, and oil which emanate from diffuse sources throughout the harbor in order to achieve the goals of improved water quality and enhancement of the attractiveness of the waters of Boston Harbor.

(The balance of the report follows.)

NERBC Comprehensive Water Quality Management Plan

In May 1970 the New England River Basins Commission published a report, prepared by the Boston Harbor Water Quality Management Coordinating Group, on a Plan of Study for a Water Quality Management Program for Boston Harbor. The goal of the plan is to "systematically develop a total water quality management program for the harbor and tributary area to insure the waters will meet established water quality standards and will be capable of supporting all legitimate water uses."

Progress toward developing the Comprehensive Water Quality Management Plan was reported in October 1970 by the coordinating group. The elements of progress accomplished at that time were the formulation of the group working cooperatively to develop a guideline for short- and long-term action to achieve the water quality goals and development of a plan of study to ensure coordinated development of plan formulation. A mathematical water quality model to assist in decision making has been completed. Preparation of planning inputs is well underway. A simplified diagram for plan development is shown in Figure 2.

There will be interim reports and recommendations published each year and the final plan should be completed by June 1972.

Metropolitan District Commission Regulations

The sample data presented on the metal scan analysis on the sludge samples from the Nut Island sludge digester indicate a substantial quanity of toxic metals are discharged into the MDC sewerage system. The MDC has taken steps to prevent this by issuing rules and regulations covering the discharge of sewage, drainage, substances or wastes into any sewer under its control, or any sewer tributary thereto. Strict enforcement of these regulations is now required by all responsible authorities. These regulations are given in Appendix B.

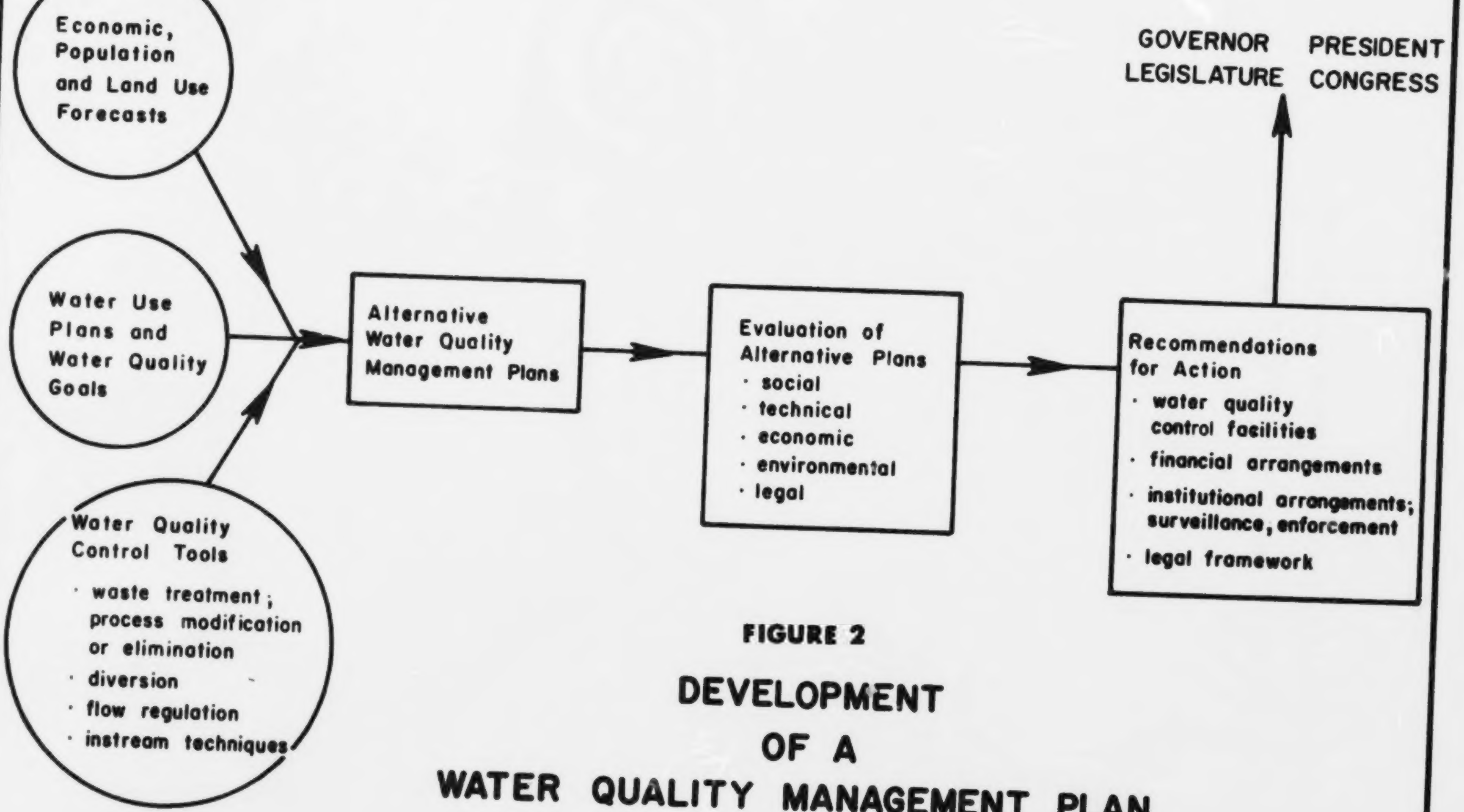

Economic, Population and Land Use Forecasts
Water Use Plans and Water Quality Goals
Water Quality Control Tools
· waste treatment; process modification or elimination
· diversion
· flow regulation
· instream techniques
Alternative Water Quality Management Plans
Evaluation of Alternative Plans
· social
· technical
· economic
· environmental
· legal
Recommendations for Action
· water quality control facilities
· financial arrangements
· institutional arrangements; surveillance, enforcement
· legal framework
GOVERNOR
LEGISLATURE
PRESIDENT
CONGRESS

FIGURE 2

DEVELOPMENT
OF A
WATER QUALITY MANAGEMENT PLAN
FOR
BOSTON HARBOR DRAINAGE AREA

APPENDIX A

(Commonwealth of Massachusetts)

Licensing of Marinas. Chapter 693 of the Acts of 1970, Sec. 2, amended Chapter 91 of the General Laws by inserting the following section. It was approved August 18, 1970, but will not take effect until May 15, 1972.

Section 59B. No marina shall be operated without a license issued by the division of water pollution control. Said division shall not issue any such license unless such marina provides (1) adequate facilities for the collection, treatment and disposal of sewage or other sanitary waste, as said division may specify, including facilities for the purging out and cleaning of holding tanks, the contents of which shall be then disposed of in such manner as not to be discharged into or near any waters of the commonwealth, unless such discharge is to a municipal sewerage system or to an adequate sewage treatment or disposal facility approved by the division of water pollution control; (2) adequate and conveniently located dockside toilet facilities for the use of the occupants of watercraft; and (3) adequate and conveniently located trash receptacles or similar devices designed for the disposal of litter and refuse.

Any license issued under this section shall be for a term of one year and may be renewed annually. The fee for such annual license shall be fifty dollars and the fee for a renewal of such license shall be ten dollars.

APPENDIX B

CLARIFICATION OF SECTIONS 3-C and 4-E
ARTICLE II
USE OF METROPOLITAN SEWERAGE SYSTEM

M.D.C. RULES AND REGULATIONS
COVERING DISCHARGE OF SEWAGE, DRAINAGE, SUBSTANCES OR WASTES

This is intended to assist industries discharging toxic or objectionable metals or non-metals to municipal sewers within the M.D.C. sewer system in interpreting the recently adopted Rules and Regulations which became effective January 1, 1971.

Toxic or objectionable metals include, but are not limited to, the following:

- Antimony
- Arsenic
- Barium
- Beryllium
- Boron
- Cadmium
- Chromium
- Copper
- Iron
- Lead
- Manganese
- Mercury
- Nickel
- Selenium
- Silver
- Tin
- Zinc

Toxic or objectionable non-metals include, but are not limited to:

- Cyanides
- Phenols
- Sulphides
- Chlorides

All wastes containing toxic heavy metals must be treated ~~for removal of these~~ metals to values at least equivalent to the minimum solubility ~~of their oxides~~ or hydroxides. Limits for non-metals must be reviewed and approved separately.

Industries discharging or requesting to discharge beryllium, mercury, arsenic or selenium in any quantities are referred to the Division of Water Pollution Control.

The attainment of specific levels for discharge to the public sewer by dilution in the absence of treatment (i.e., by the use of extraneous or other non-process water) is prohibited.

Direct disposal of concentrated plating solutions, whether neutralized or not, shall be prohibited.

Provisions must be made to prevent against accidental or intended discharge.

Sludges, filter cakes, etc., produced by treatment or by naturally occurring deposition in operating baths or tanks, shall not be discharged to the sewer.

A description of the proposed treatment system, including flows of all waste drains and concentrations of toxic or objectionable metals or non-metals before and after treatment must be submitted to the M.D.C. for approval.

PUBLICATION No. 57[illegible], 1,500 copies
Approved by Alfred C. Holland, State Purchasing Agent

METROPOLITAN DISTRICT COMMISSION
SEWERAGE DIVISION

20 Somerset Street, Boston

RULES AND REGULATIONS
Covering Discharge of Sewage, Drainage, Substances or Wastes

Under the authority of Chapter 92 of the General Laws (Sections 2, 3, 9, 102), and under the authority and in compliance with the directive contained in Section 12 of Chapter 705 of the Acts of 1945, the Metropolitan District Commission has established the following rules and regulations covering the discharge of sewage, drainage, substances or wastes into any sewer under its control, or any sewer tributary thereto.

ARTICLE I

DEFINITIONS

Unless the context specifically indicates otherwise, the meaning of terms used in these rules and regulations shall be as follows:

1. "BOD" (denoting Biochemical Oxygen Demand) shall mean the quantity of oxygen utilized in the biochemical oxidation of organic matter under standard laboratory procedure in five (5) days at 20°C, expressed in milligrams per liter.
2. "Building Sewer" shall mean the connection from a building to the municipal or Commission sewer.
3. "Combined Sewer" shall mean a sewer receiving both surface runoff and sewage.
4. "Commission" shall mean the Metropolitan District Commission of Massachusetts, or any other commission, board or officers duly authorized to act for the Commonwealth in the application of these rules and regulations.
5. "Garbage" shall mean solid wastes from the domestic and commercial preparation, cooking, and dispensing of food, and from the handling, storage, and sale of produce.
6. "Garage" shall mean any building wherein is kept or stored one or more motor vehicles, including among others a public or private garage, carport, motor vehicle repair shop or paint shop, service station, lubritorium, car wash, or any building used for similar purposes.

This Publication No. 5331 Approved by Alfred C. Holland, State Purchasing Agent

7. "Industrial Wastes" shall mean the liquid wastes from industrial manufacturing processes, trade, or business as distinct from sanitary sewage.

8. "Municipality" shall mean any city or town that discharges sewage into the Metropolitan Sewerage system whether the city or town is a member of the Metropolitan Sewerage District by legislative action or is served by contract with the Metropolitan District Commission.

9. "Person" shall mean any individual, firm, company, association, society, corporation, or group.

10. "pH" shall mean the logarithm of the reciprocal of the weight of hydrogen ions in grams per liter of solution.

11. "Properly Shredded Garbage" shall mean the wastes from the preparation, cooking, and dispensing of food that have been shredded to such a degree that all particles will be carried freely under the flow conditions normally prevailing in public sewers, with no particle greater than one-half (1/2) inch (1.27 centimeters) in any dimension.

12. "Public Sewer" shall mean a sewer in which all owners of abutting properties have equal rights, and is controlled by public authority.

13. "Sanitary Sewer" shall mean a sewer which carries sewage and to which storm, surface, and groundwaters are not intentionally admitted.

14. "Sewage" shall mean a combination of the water-carried wastes from residences, business buildings, institutions, and industrial establishments, together with such ground, surface, and stormwaters as may be present.

15. "Sewage Treatment Plant" shall mean any arrangement of devices and structures used for treating sewage.

16. "Sewer" shall mean a pipe or conduit for carrying sewage.

17. "Sewerage Works" shall mean all facilities for collecting, pumping, treating, and disposing of sewage.

18. "Shall" is mandatory; "May" is permissive.

19. "Slug" shall mean any discharge of water, sewage, or industrial waste which in concentration of any given constituent or in quantity of flow exceeds for any period of duration longer than fifteen (15) minutes more than five (5) times the average twenty-four (24) hour concentration or flows during normal operation.

20. "Storm Drain" (sometimes termed "storm sewer") shall mean a sewer which carries storm and surface waters and drainage, but excludes sewage and industrial wastes, other than unpolluted water.

21. "Suspended Solids" shall mean solids that either float on the surface of, or are in suspension in water, sewage, or other liquids, and which are removable by laboratory filtering.

ARTICLE II

USE OF METROPOLITAN SEWERAGE SYSTEM

1. All municipalities which connect their public sewers with the Metropolitan sewers shall do so subject to the direction, control and regulation of the Commission and any person may, subject to regulations of the Commission and to such terms, conditions and regulations as each municipality may prescribe, connect building sewers with such sewers. All new systems of sewers and extensions of existing systems shall be constructed so as to separate storm water from ordinary sewage. G. L. Chap. 92, Sect. 2..

2. The plumbing of any estate or premises shall be so arranged as to keep such waters as described in 3 (a) separate from the sewage and connections shall be made which will conduct the waters to a drain or watercourse and the sewage to the public sewer; but where only one conduit shall have been provided by the municipality, such connections shall be constructed into the street and connected to the conduit so provided, and the municipality shall provide the other conduit and all necessary connections with either conduit. G.L. Chapt. 92, Sec. 9.

3. No municipality shall discharge or cause to be discharged or allow to be discharged into any Metropolitan sewer or any sewer tributary thereto any of the following described waters or wastes:

   (a) Any stormwater, surface water, roof runoff, tidewater, river water, ground water, subsurface drainage, uncontaminated cooling water, or unpolluted industrial process waters.

   (b) Any gasoline, benzene, naphtha, fuel oil, crude petroleum, or any other of its products, or any other flammable or explosive liquid, solid or gas.

   (c) Any waters or wastes containing toxic or poisonous solids, liquids or gases in sufficient quantity, either singly or by interaction with other wastes, to injure or interfere with any sewage treatment process, constitute a hazard to humans or animals, create a public nuisance, or create any hazard in the receiving waters of the sewage treatment plants.

(d) Any waters or wastes having a pH higher than 9.5 or lower than 5.5, or having any other corrosive property capable of causing damage or hazard to structures, equipment, and personnel of the sewerage works.

(e) Any solid or viscous substances in quantities or of such size as to be capable of causing obstruction to the flow in sewers, or other interference with the proper operation of the sewerage works; such as, but not limited to ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, unground garbage, whole blood, paunch manure, hair and fleshings, entrails, paper dishes, cups, milk containers, etc., either whole or ground by garbage grinders.

No municipality shall discharge or cause to be discharged or allow to be discharged into any Metropolitan sewer or any sewer tributary thereto any of the following described substances, materials, waters, or wastes if it appears likely in the opinion of the Commission that such wastes can harm either the sewers, sewage treatment process, or equipment, have an adverse effect on the receiving waters, or can otherwise endanger life, limb, public property, or constitute a nuisance. In forming its opinion as to the acceptability of these wastes, the Commission will give consideration to such factors as the quantities of subject wastes in relation to flows and velocities in the sewers, materials of construction of the sewers, nature of the sewage treatment process, capacity of the sewage treatment plant, degree of treatability of wastes in the sewage treatment plant, and other pertinent factors. The substances prohibited are:

(a) Any liquid or vapor having a temperature higher than one hundred fifty (150)°F (65°C).

(b) Any water or waste containing fats, wax, grease, or oils, whether emulsified or not, in excess of one hundred (100) mg/l or containing substances which may solidify or become viscous at temperatures between thirty-two (32)° and one hundred fifty (150)°F (0° and 65°C).

(c) Any garbage that has not been properly shredded.

(d) Any waters or wastes containing strong acid iron pickling wastes, or concentrated plating solutions whether neutralized or not.

(e) Any waters or wastes containing iron, nickel, chromium, copper, cyanide, zinc, and similar objectionable or toxic substances; or wastes exerting excessive chlorine requirement, to such degree that any such material received exceeds the limits established by the Commission for such materials.

(f) Any waters or wastes containing phenols or other taste-producing or odor-producing substances, in concentrations which exceed limits which may be established by the Commission as necessary to meet the requirements of the State or Federal agencies of jurisdiction for such discharge to the receiving waters.

(g) Any radioactive wastes or isotopes of such half-life or concentration as may exceed limits established by the Commission in compliance with State or Federal regulations.

(h) Any material which exerts or causes:

(1) Unusual concentrations of inert suspended solids (such as, but not limited to, Fuller's earth, lime slurries, and lime residues) or of dissolved solids (such as, but not limited to, sodium chloride and sodium sulfate).

66

(2) Excessive discoloration (such as, but not limited to, dye wastes and vegetable tanning solutions).

(3) Unusual BOD, chemical oxygen demand, or chlorine requirements in such quantities as to constitute a significant load on the sewage treatment works.

(4) Unusual volume of flow or concentration of wastes constituting "slugs" as defined herein.

(i) any waters or wastes containing substances which are not amenable to treatment or reduction by the sewage treatment processes employed, or are amenable to treatment only to such degree that the sewage treatment plant effluent cannot meet the requirements of other public agencies having jurisdiction over discharge into the receiving waters.

5. No municipality shall discharge or cause to be discharged or allow to be discharged into any Metropolitan sewer or any sewer tributary thereto any septic tank or cesspool cleanings or any sewage or industrial wastes which originate in any territory outside the limits of the Metropolitan Sewerage District.

6. Garages and other establishments where gasoline is used or where wastes containing grease in excessive amounts or any flammable wastes, sand, or other harmful ingredients can be discharged and are connected with public sewers, shall be provided with a suitable trap or separator. All traps or separators shall be of a type and capacity approved by the Commission and shall be located so as to be readily and easily accessible for cleaning and inspection. Where preliminary treatment or flow-equalizing facilities, or traps or separato are provided for any waters or wastes, they shall be maintained continuously in satisfactory and effective operation by the owner at his expense.

8. When required by the Commission, the owner of any property serviced by a building sewer carrying industrial wastes shall install a suitable control or measuring device together with such necessary manholes, chambers, meters any other appurtenances in the building sewer to facilitate observation, sampling, and measurement of the wastes, such manhole or chamber, when required, shall be accessibly and safely located and shall be constructed in accordance with plans approved by the Commission. The manhole, chamber, meters, etc., shall be installed by the owner at his expense, and shall be maintained by him so as to be safe and accessible and in good operating condition at all times. The records from the meters and measuring devices shall be furnished to the Commission upon request therefor.

9. All measurements, tests, and analyses of the characteristics of waters and wastes to which reference is made in these rules and regulations shall be determined in accordance with the latest edition of "Standard Methods for the Examination of Water and Wastewater," published by the American Public Health Association, and shall be determined at the control manhole or chamber provided, or by use of suitable samples taken at the control manhole or chamber. In the event that no special manhole or chamber has been provided, the control point shall be considered to be the nearest downstream manhole in the public sewer to the point at which the building sewer is connected. Sampling shall be carried out by customarily accepted methods to reflect the effect of constituents upon the sewerage works and to determine the existence of hazards to health and property. The particular analyses involved will determine whether a twenty-four (24) hour composite of all effluents of the premises is appropriate or whether a grab sample or samples should be taken. BOD and suspended solids analyses shall normally be obtained from 24 hr. composites of all effluents whereas pH's shall normally be determined from periodic grab samples.

10. Failure on the part of any municipality to comply with any rule or regulation contained herein, or with any order made under the authority thereof, lawfully affecting such municipality, shall be sufficient cause for the levying and collecting by the Commission from such municipality of such additional assessment or assessments as the Commission may deem necessary to compensate it for the disposal of sewage, drainage, substances or wastes from such municipality; provided, that no such additional assessment shall be levied on any such municipality in any one year which shall exceed the lesser of an amount equal to one twentieth of one per cent of the taxable value of such municipality, or the sum of two hundred thousand dollars.

Ch.705, Acts 1945

No statement contained in this article shall be construed as preventing any special agreement or arrangement between the Commission and any municipality whereby an industrial waste of unusual strength or character may be accepted by the Commission.

MR. KNUDSON: Mr. Chairman, that completes the joint report.

MR. PAHREN: Thank you, Mr. Knudson.

It might be well at this time, if any of us have questions on the portions of the report that you and Mr. Ferullo might answer, that we take care of these questions and answers right now.

I have a couple that will help to clarify some of the points that you fellows brought out.

I may have missed it, but did you indicate a completion date on Recommendation No. 3, Mr. Knudson, for the completion of the combined sewer overflow structures for the several communities?

MR. KNUDSON: That is correct. We have jointly recommended that they be completed by December 1973.

MR. PAHREN: All right. Thank you.

My next question probably could be answered better by Al Ferullo. Maybe you could both stand there.

With regard to Conclusion No. 1 on Hull, has Hull begun the final plans and specs? Where do we stand on that implementation schedule?

MR. McMAHON: Mr. Chairman, perhaps I can answer that.

MR. PAHREN: Sure.

MR. McMAHON: Yes, Hull has retained their engineer for the final planning. How far along I couldn't really say. They retained an engineer I believe about 6 weeks ago.

MR. PAHREN: Do you think there would be any problem in completing the plans and specs by June 1972?

MR. McMAHON: Yes.

MR. PAHREN: You think there will be a problem?

MR. McMAHON: I think it will probably take about a year to complete the final plans.

MR. STEIN: But you would have no objection to a program of interim dates which was reasonable?

MR. McMAHON: No.

MR. PAHREN: Mr. Ferullo, on page 15 you indicated that the Nut Island waste treatment plant was receiving more flow than it was designed for. Of course, these are average figures. Do they bypass during storms or when the flows are a lot higher than the 112 mgd?

MR. FERULLO: No, they do not.

MR. PAHREN: Under no circumstances do they bypass?

MR. FERULLO: I am quite sure they don't. The flow goes through the plant, goes through faster but goes through the plant.

MR. PAHREN: Goes through fast and they reduce the efficiency? How about in the sewerage system itself? Are there any of those that bypass either in --

MR. FERULLO: Within the sewerage system of the MDC there are overflows during higher flows at certain pumping stations.

MR. PAHREN: But at the Nut Island plant itself it just zips through with lower efficiency then? Is that correct?

MR. FERULLO: That is my understanding. Is it yours, Myron?

MR. KNUDSON: I thought at times, during periods of high flow, that they do find it necessary to bypass, but I stand corrected if you are confident.

MR. PAHREN: Well, is there anyone from MDC who could actually confirm or deny the statement? Is there any bypass at Nut Island during periods of very high flows?

Could you identify yourself for the record?

STATEMENT OF
MARTIN WEISS
SUPERINTENDENT, DEER ISLAND TREATMENT PLANT
METROPOLITAN DISTRICT COMMISSION
WINTHROP, MASSACHUSETTS

MR. WEISS: My name is Martin Weiss. I am with the MDC.

The Nut Island plant has a flowthrough capacity of 350 mgd. So there is no bypassing.

MR. PAHREN: There is no bypass? Under no circumstances?

MR. WEISS: Right.

MR. PAHREN: How about at Deer Island? Is that capacity such that even during the periods of high flow and the high tides-- Is there any bypass?

MR. WEISS: The Deer Island plant has a flowthrough capacity of 925 mgd, and it doesn't require any bypassing.

MR. PAHREN: Okay, Mr. Weiss.

Now, on page 13, and also on item 9 of the recommendations, this question is with regard to Somerville and Chelsea. Have these two communities already initiated the action to rehabilitate their combined sewer systems?

MR. FERULLO: Somerville is building the marginal conduit which will discharge downstream of Amelia Earhart Dam, so in a sense they are moving.

Chelsea, as far as I know, has not had a report made on its system and, therefore, is not moving to separate.

MR. PAHREN: Has the Division issued any order yet to Chelsea to begin?

MR. FERULLO: We have not at this time, no.

MR. PAHREN: Do you plant to in the near future?

MR. FERULLO: Certainly.

MR. PAHREN: Okay. We will assume that in the very near future an order to Chelsea will be issued.

Is there any more that you believe needs to be done other than this marginal conduit with Somerville to take care of their problem?

MR. FERULLO: I am not really certain as to what else -- what Somerville has to be separated or taken care of.

MR. PAHREN: Do they plan or are you planning to ask them to hire a consulting firm to investigate the adequacy of their system and make recommendations to rehabilitate the system?

MR. FERULLO: I will examine to see whether or not a report has been submitted relative to their sewerage system. If it has, we will review it and issue orders accordingly.

If they have not submitted a report and a report is in order, we will ask for a report on the system.

MR. PAHREN: You will issue orders to initiate this work -- or at least the consulting engineering firm to investigate and make recommendations to the city?

MR. FERULLO: Yes.

MR. PAHREN: Okay.

Now, the next item refers to page 12 of the report. We are talking about the city of Cambridge. This initial 5-year plan consists of five separate projects. You indicate that this will reduce the combined flows to the MDC. Does this word "reduced" mean it will not be totally taken care of but will be substantially improved?

In other words, I want to clarify what you mean by "reduced."

MR. FERULLO: Yes. The intention here, the hope, is that the untreated overflows to the Charles River will occur only once in 5 years consistent with what is anticipated at the BU facility. But there will be overflows. We can't say for certain, but we are hopeful it will be no more frequent than once in 5 years.

MR. PAHREN: Has the Division issued orders to Cambridge to carry out the five projects that you have listed for phase I?

MR. FERULLO: Yes.

MR. PAHREN: How are they proceeding? I notice the first completion date for project I is September 1972.

MR. FERULLO: That is a year away. The orders were issued very recently. And I don't know really what action has been taken at this time.

MR. PAHREN: Okay. Do you anticipate any problems that Cambridge might have in implementing this program?

MR. FERULLO: I really can't say.

MR. PAHREN: Okay. I have no further questions.

I might point out that in regard to questions that the MDC might better answer, what I will do is withhold my questions until the MDC representative is here. Does anyone else --

MR. QUARLES: Mr. McMahon, would you like to ask questions? Or Mr. Brownell?

MR. BROWNELL: No questions.

MR. McMAHON: Mr. Chairman, before we go too far on approving the status report that has been prepared, I would like to read into the record a memorandum of agreement between the Metropolitan District Commission and the Division of Water Pollution Control. It essentially goes along with most of the conclusions and recommendations of the report. However, the procedures are somewhat different, and there are a few minor changes in dates.

Therefore, I would recommend that I read this into the record, and we make the necessary corrections to the conclusions and recommendations in executive session if this is appropriate.

MR. QUARLES: This is satisfactory. Please feel free to proceed with the reading of the memorandum of agreement.

MR. McMAHON: This is the Commonwealth of Massachusetts Agreement in Connection with Pollution Control and Sewage Disposal, dated October 21, 1971. This is a subsequent agreement to one that was signed several years ago between the MDC and the Division of Water Pollution Control, most of which work has already been completed.

This agreement reads:

"This agreement is entered into between the Metropolitan District Commission, hereinafter called the 'Commission,' and the Water Resources Commission, acting by and through its Division of Water Pollution Control, hereinafter called the 'Division.'

Memorandum of Agreement

"The Commission is vitally concerned with the expansion of sewerage and sewage disposal facilities for the Metropolitan Sewerage Districts, and the Division is vitally interested in water pollution abatement. Both parties desire to reduce pollution and improve the water quality of Boston Harbor and tributary water courses.

"Therefore, the Commission and the Division do mutually agree as follows:

"The Commission shall, subject to authorization and appropriation by the Legislature, undertake the following:

"(1) Study alternative methods for the disposal of sludge from the Nut Island and Deer Island Treatment Plants and file a report on alternative methods with the Secretary of Environmental Affairs and the Division on or before April 1st, 1972;

"(2) Prepare a preliminary engineering report indicated by the results of the above study for submission to the Secretary of Environmental Affairs and the Division by April 1st 1973;

"(3) Study the adequacy of the present Metropolitan Sewerage System and the feasibility of extending and expanding it in order to provide adequate capacity through the year 2020, and to submit report of such study to the Secretary of Environmental Affairs and the Division on or before January 1st, 1973.

"(4) Prepare a preliminary engineering report, based on the results of the above study, and including an outline of the adequacy of the Metropolitan Sewerage System to handle present flows; and outlining such projects on sewers, pumping stations and wastewater plants as may be needed to insure adequate capacity and treatment through the year 2020; and to submit such report to the Secretary of Environmental Affairs and the Division on or before June 1st, 1973.

"(5) Increase and improve the enforcement of the recently adopted Sewer Use Rules and Regulations particularly as they apply to the discharge of toxic materials to sewers within the MDC sewerage system, seek enabling legislation as required, and seek to increase personnel and budget of the inspection section and laboratories.

"(6) To petition the legislature to authorize the Metropolitan District Commission to repair the tidegates in Charlestown and East Boston. (By vote of the Commission on October 20, 1971)

"The Division shall undertake the following:

"(1) Render staff assistance to the Commission in investigating the subject matters of this agreement and in preparing the reports required under this agreement;

"(2) Support the efforts of the Commission to obtain the necessary legislative authorizations to undertake the studies and reports required under this agreement;

"(3) Obtain and provide to the Commission, subject to Federal and State eligibility requirements, planning, research and demonstration monies to conduct the aforesaid studies and make engineering reports."

This agreement is signed by four parties: Arthur W. Brownell, Commissioner of the Department of Natural Resources; Dr. Charles H. W. Foster, Secretary of the Executive Office of Environmental Affairs; myself; and Commissioner John W. Sears of the Metropolitan District Commission, again dated October 21, 1971.

I would submit this for the record, Mr. Chairman.

MR. QUARLES: Thank you, Mr. McMahon.

All of the conclusions and recommendations will be given very serious consideration at the executive session which will follow the formal session, and we certainly welcome into the record this memorandum of agreement. It will also be given serious consideration by the conferees in the executive session.

Do you have any further questions or comments, either Mr. McMahon or Mr. Brownell?

MR. McMAHON: No.

MR. BROWNELL: No.

MR. QUARLES: Mr. Newman, would you care to ask any questions?

MR. NEWMAN: No.

MR. QUARLES: Mr. Pahren.

MR. PAHREN: I have a question, Mr. Quarles, that I omitted before.

On Recommendation 13 concerning small amounts of floating debris and oil, etc., who would you plan to have implement this? The Division of Waterways or the Massachusetts Port Authority or who? Do you have any comment on that?

I am addressing myself to the Massachusetts conferees.

MR. McMAHON: Mr. Chairman, I think this will be handled later in the morning when Mr. King, Associate Commissioner of the Department of Public Works, will be here.

MR. PAHREN: Good.

One other thing. On your boating discussion, where do we stand on these proposed rules and regulations? And do you think that this might require holding tanks or just discharging at facilities at the marinas? Or could you give me a feeling on that?

MR. McMAHON: We have held hearings throughout the State. We are in the process now of adopting them. Before we adopt them, we wish to meet with Mr. McGlennon and see if we can get a waiver on Massachusetts waters.

Essentially, we are primarily interested in a boat pollution control law that will not allow discharges or will have tight tanks with the necessary facilities at the marinas to handle the waste. Along with this we do have a marina control law, so that we have both the authority on the boats themselves and also the control at the marina sites. But before we can adopt these standards and not be preempted by the present Federal law, it will be necessary to get a waiver from the Federal Government, and we expect or hope to meet with Mr. McGlennon and other necessary parties within the next few weeks.

MR. STEIN: Let me ask a clarifying question. You are going to insure adequate receiving and disposal facilities for watercraft at all marinas. This assumes, I take it, that this will be able to empty the heads of the craft?

MR. McMAHON: Yes.

MR. STEIN: The question that we had was: Are you going to require your pleasurecraft here to have only holding tanks or not?

MR. McMAHON: Holding tanks or nothing. For example, on inland waters we would prefer just no toilets, no holding tanks. The incidence rates will be so small that we wouldn't worry about that risk.

MR. STEIN: Right.

MR. QUARLES: No further questions, Mr. Pahren?

MR. PAHREN: Not at this time.

MR. QUARLES: All right. It is customary to take a brief recess during the course of the morning. We have further presentations to be made on behalf of the Commonwealth of Massachusetts and I believe by the Commissioner of the Metropolitan District Commission. I think that probably this is the best time to take a recess.

We will now recess for approximately 5 minutes.

(Whereupon, a recess was taken.)

MR. QUARLES: We will resume the proceedings at this time, if you would please take your seats.

Mr. McMahon, I will turn to you and ask you to introduce the next speaker.

MR. McMAHON: I would ask Commissioner Brownell if he will do this honor.

MR. BROWNELL: Mr. Chairman, the Commonwealth will present eight speakers to the conference this morning. The first person I would like to call upon is the new Secretary of the Executive Office of Environmental Affairs for the Commonwealth, Dr. Charles H. W. Foster.

STATEMENT OF
CHARLES H. W. FOSTER
SECRETARY OF ENVIRONMENTAL AFFAIRS
COMMONWEALTH OF MASSACHUSETTS
BOSTON, MASSACHUSETTS

DR. FOSTER: Thank you very much, Commissioner Brownell.

Mr. Chairman, official conferees, participants, ladies and gentlemen. I am Charles Foster, Secretary of Environmental Affairs for the Commonwealth of Massachusetts, representing His Excellency, Governor Francis W. Sargent.

As a participant at the two earlier sessions of this conference and an individual nationally known for his lifelong interest in the environment, the Governor wishes me to express his personal regrets at being unable to be here today.

This also marks my own return to Federal enforcement proceedings after nearly 5 years away from public service. Having reviewed the record of previous Boston

Harbor sessions during this period, I have been impressed by the distance we have progressed since the earlier enforcement conferences in New England. At these, the matter of State-Federal confrontation often seemed more the issue than the improvement of the river in question.

As the opening spokesman for the Commonwealth, I should explain for the record the significant change in governmental structure that has taken place in Massachusetts since the 1969 conference. Effective May 1, 1971, and implemented in August of this year, has been the first phase of a sweeping executive reorganization which will convert some 300 separate instruments of government into 10 cabinet-level agencies. While government reorganization in itself will not clean polluted water, it should expedite that process.

For example, the Executive Office of Environmental Affairs which I now head embraces the State agencies most directly concerned with the abatement of pollution in Boston Harbor -- The Department of Natural Resources, and its Division of Water Pollution Control, and the Metropolitan District Commission.

Although each of the agencies still retains all of its statutory powers and responsibilities and will properly speak for itself at this conference, the cabinet structure now provides significant opportunity for the resolution of policy differences, the reconciliation of jurisdictional questions, the streamlining of planning efforts, and the advancement of remedial programs relating to the harbor.

The preplanning for the State participation in this conference -- a miniature and continuing conference in itself -- constitutes one manifestation of a principle which will become even more apparent in the months ahead.

May I close this brief statement with a final personal observation. I sincerely hope that the cooperative tone of this conference will continue. We must search for solutions, not suspects. There needs to be genuine understanding on the Federal side that 300 years of hard usage of a harbor cannot be corrected overnight, that the improvements we all wish to see will require a massive infusion of tax dollars authorized by bodies not present here today who are the real conferees -- the Congress of the United States, the General Court of the Commonwealth, and the elected officials of the municipalities involved.

Conversely, there needs to be an equal understanding on the part of those jurisdictionally responsible for present conditions that the status quo is not enough, that they must consciously strive for a better harbor environment in response to the clear mandate of a concerned public.

I believe I can pledge the Commonwealth's best intentions of fulfilling its end of the bargain. I only hope that the new Federal Water Pollution Control Act as it emerges from Congress this year will take full advantage of the willingness of States like Massachusetts to engage in such a cooperative venture.

Thank you very much, Mr. Chairman.

MR. QUARLES: Thank you, Dr. Foster.

Are there any questions at this time?

(No response.)

MR. BROWNELL: Mr. Chairman, the next person I would like to call upon to make a presentation is the Commissioner of the Metropolitan District Commissioner, Commissioner John W. Sears.

STATEMENT OF

JOHN W. SEARS

COMMISSIONER, METROPOLITAN DISTRICT COMMISSION

BOSTON, MASSACHUSETTS

MR. SEARS: Mr. Chairman, Mr. McGlennon, members of the panel, Secretary Foster, Metropolitan District Commissioners, other commissioners, and my colleagues in and out of government, others interested in Boston Harbor and its tributaries.

When my predecessor, Commissioner Whitmore, addressed you in your last conference in April 1969, he described the MDC's very large sewage distribution and treatment system and discussed some of the features of the then newly-opened Deer Island sewage treatment plant. The system of which he spoke included the two treatment plants, three headworks, 223 miles of sewer receiving discharges from 4,800 miles of city and town sewers from our 43 members at 1,826 connecting points.

He described the magnitude of the task of inspecting, cleaning, and maintaining the sewers, siphons, outfalls, and connections appurtenant to that system. He may have mentioned that we had spent over $130 million of the funds of our member communities, augmented by about $20 million in State and Federal funds, in various water pollution projects.

It happens that today is the day of our "stockholders meeting," if I may so refer to it. The municipal authorities who actually pay our bills, and for whom we try to provide efficiencies of administration and the economy of scale that should flow from a regional service delivery agency, are here with us to learn of our activities in the last year and some of our plans for the future.

It is most appropriate really that they be with us as we discuss with you the steps which the Federal Government and the State water pollution authorities hope and expect that MDC will next take in its battle to improve water quality conditions in our waterways, particularly in Boston Harbor and the three largest rivers which flow into it -- the Charles, the Mystic, and the Neponset -- in all of which the MDC has ongoing sewer and pollution control programs.

We take a lively interest in all these waterways, Mr. Chairman, and in the case of the Charles we have an assigned shared statutory responsibility for water quality and limited regulatory power.

It is my assignment to describe to you what the MDC has been doing since Commissioner Whitmore reported to you 2 years ago and what some of our problems are and some of the efforts and plans to solve those problems. I should like to do one thing he apparently did not do. I should like to tell you what a gigantic stake the Commission has in Boston Harbor and its tributaries and what a conviction we have -- with the Environmental Protection Agency and the Water Pollution Division and Governor Sargent and Secretary Foster and the entire environmental community -- to see that harbor improved and made as soon as possible into the priceless recreational and natural asset it was when Myles Standish sailed into it and consulted with the Sachem Chickatawbut exactly 350 years ago this month.

When Commissioner Whitmore reported to you in 1969, the Commission owned Castle Island, which is now connected to the Boston shore, and George's and Lovell's Islands in the mid-harbor. Last summer we bought Peddock's Island, the second largest island in the harbor, and also began the acquisition of the tip of Deer Island, which is now really a peninsula since the Shirley Gut was closed by a storm in 1938.

In all five of these locations, the Commission has bathing beaches. Three of them are presently in public use. Over 100,000 people used these islands last summer. On a hot summer weekend we had more than 6,000 people arriving by boat to visit George's Island alone.

We are at this moment building piers at Lovell's and Peddock's and refurbishing buildings on three islands. We are designing facilities for sailing at three of the locations. We have for two summers had camping and hiking in progress in the islands.

We are bringing this magnificent harbor to life.

Our police are working in that harbor, and we have employees who are living in it year-round.

In short, we are the very people who yearn most anxiously to see the use of that harbor by the public increase and to see the amenities improve. We also own approximately 20 miles of ocean beach in the harbor, much of it threatened by the same devastating problem of combined sewer overflows, which seems to us the principal challenge to water quality there. We provide over 90 percent of the major oceanwater swimming for the metropolitan population.

In addition, we share your anxieties about the rivers which are contributing to the poison of the harbor. In the Charles, the MDC is at midpoint in a multi-million dollar effort to divert storm overflows to treatment plants or to treat storm overflows before they hit the river. This past year we opened a pioneering detention and chlorination station in the basin, and it is treating during storms and treating discharges which used to flow directly into the river. We have just broken ground for an extension to this new station's conduit system so as to stop more untreated discharge.

Governor Sargent has just signed, as chapter 881 of 1971 a $13.5 million bond issue which we hope remains federally reimbursable, which will enable us to pick up overflows at the very mouth of the river and pump them treated out of the freshwater system rather than discharging them untreated directly into it.

The Commission hopes that we are misinformed in hearing that Congress does not wish to fund the desperately needed new Charles River Dam this year. This dam is designed to prevent slugs of polluted harbor water from rushing into the freshwater basin, and the Commonwealth has authorized our share of $8 million.

We have also asked the Massachusetts Legislature for $7 million to clean the waters of the Charles, and the House passed this measure yesterday. If enacted, this bill would enable us to remove barriers and to make such experiments as modifying the present dam to sluice bottom waters instead of top waters, installing instream treatment if it proves feasible, aerating, and taking other steps against urban runoff.

We must be in a position to commence the great and enormously costly effort which some now reckon at more than $600 million to end the combined sewer systems which our experts here believe to be a prime, if not the prime, source of the corruption of the harbor.

We are at work as well on the other major rivers which feed into the Charles. We have supported the formation of watershed associations -- actually invented them. We have voted to install the engines and pumps in our Earhart Dam, which will help in our fight to keep the Mystic free of salt.

We are in the process of letting a contract for the experimental Somerville marginal conduit, again presumptively with Federal support, to discharge treated water outside that basin.

This past weekend we conducted the latest in a series of citizen-aided riverbank cleanups, in which we again removed several hundred truckloads of debris from the river and its banks, as here in the past on the Charles and on the Neponset Rivers we have done the same.

As for the Neponset, it continues to improve under implementation pressure from the Water Pollution Division, as a rosult of which all industrial wastes are now headed for our trunk sewers if we can solve the low flow problem.

In the harbor itself, Mr. Chairman, we have struggled, so far unsuccessfully, to obtain public and legislative support for a program which would enable us to pick up and treat waters now overflowing into five of our beaches in South Boston and Dorchester. This week we will be resubmitting legislation to achieve this result.

Since the last Federal conference, we have chlorinated our Deer Island effluent and sludge year-round, and the dramatic results are reflected in the reopening of shellfish beds, improved coliforms, and generally acceptable standards now described in the recent Hydroscience report.

We are in the process of arranging to chlorinate the Nut Island sludge as well, though these deposits, like the Deer Island deposits, are going out into the ocean.

We also have, under the urging of the Water Pollution Division, embarked on a lively program of repairing the city of Boston tidegates, after a brief delay when we awaited permission to go upon the city's property to do this work.

The Commission has just voted to ask the legislature for permission to do several more of these damaging gates within the city's system, some of which threaten our northern beaches.

We have spent $415,000 already and have five contracts outstanding for this work.

We are in a position now to turn 30 of these gates back to the city, leaving some 40 which still require work. We will keep going until this threat to the harbor is under control.

Meanwhile, Boston's last-century Moon Island plant has dropped from the 92 mgd of a few years back to almost none today, and the facility can be deactivated in about 8 months when MDC completes the Squantum force main.

We are rehabilitating pumping stations and treatment plants. We are removing debris. We have established inspectors against filling and encroachments. And we will expand our enforcement of our newly promulgated sewer regulations. We are teaching MDC police at our academy to recognize water pollution sources and telling them what they can do in the battle to clean the harbor and its tributaries.

We have established within the MDC an environmental task force on the harbor.

Lastly, because we acknowledge the damaging effects on the harbor of combined overflows and sludge disposal techniques which though acceptable a few years back may no longer be acceptable now, we have entered into an agreement with our sister agency, the Water Resources Commission, through the Water Pollution Division, and are committing ourselves -- if the legislature will authorize the funds -- to study alternative methods of sludge disposal, and to provide preliminary engineering reports on this subject next year, to continue and complete our tidegate program, and to crack down on industrial polluters under our sewer legislation, if the General Court will give us authority to do so.

We have also agreed to launch a comprehensive study of our entire systems, with the help of specialists, to determine how metropolitan sewage should best and most effectively be treated over the next 5 decades.

I am sorry to report that our first two efforts to carry out this commitment have been frustrated in the legislature, first in the form of House 178, a direct effort late last year to obtain study funds, and, second and most recently, this summer, a request for appropriation in the supplementary budget. We are now trying again in the legislative package that we are submitting for next year.

If the environmental authorities feel that secondary treatment of our ocean discharges will improve the water conditions of those inshore areas where our beaches and marine life stand dangerously threatened, then I can say for myself -- and, because I know of their determination to be of help, most probably can say for the Commission -- that MDC would not impose obstacles or roadblocks if the very large sums of money requisite for such an operation can be authorized and appropriated -- and perhaps if the Federal Government can help us with them -- and if all agree that this is the way in which they should be spent at this time.

That is an easy enough decision because, Mr. Chairman, while we take pride in the apparent improvement of the harbor and its water quality, shown in the Hydroscience and New England River Basin reports and in the Department of Public Health statistics, we share your determination and that of the panel, that of EPA, to try anything and everything to improve the quality of the water in Boston Harbor.

MR. QUARLES: We thank you for that fine statement, Mr. Sears.

Are there questions, first from Mr. McMahon or Mr. Brownell?

MR. BROWNELL: No.

MR. McMAHON: No.

MR. QUARLES: Are there questions, Mr. Pahren?

MR. PAHREN: Yes, I have a couple of questions of Mr. Sears.

You have remarked before about the repair of the

the tidegates and regulators, and I might point out that I think you are doing a very good job in improving the inner harbor with these repairs.

The staff report indicated that they would like to see a little bit faster progress, and I was wondering if you might indicate any problems you might be having in accelerating the repair of these tidegates and if you believe that the completion might take place by next May which was the suggested completion date in the staff report.

MR. SEARS: I think we are going to have a little trouble, Mr. Pahren, meeting May 1972, but that will not be I think for want of effort.

The MDC is a State agency subject to those careful appropriation processes that surround State agencies. And while we have already spent $415,000 on those five contracts, we know we are going to have to spend a great deal more because some of the worst and, in fact, some of the missing gates remain to be done.

I would be less than candid if I didn't say we are in trouble for the spring of 1972.

There was a delay at the start because the city, with best intention in the world, simply omitted to give us permission to go onto its property to do its gates, so we lost months at the beginning of the operation, and those months I guess will appear at the end of it. We will go on trying.

MR. PAHREN: Could you give me an estimate of when you believe this activity will be completed?

MR. SEARS: I rather hope that we'll have a better report for you in May of 1973.

MR. QUARLES: You say that you would have a report for us on the progress by May of 1973?

MR. SEARS: I think by that time we would like to, instead of reporting on progress, discuss completion and performance.

MR. PAHREN: You can get on the city's property now? Right?

MR. SEARS: We can. Not in the gates that are mentioned -- some of the gates mentioned -- in the joint report.

Actually, the report kindly takes the position that some of these gates are not ours. And that is a fact. So we may have to go back to the Legislature and ask for authority to go onto somebody else's property to do them.

MR. PAHREN: Are you planning to repair the gates, say, in Somerville, Chelsea, Cambridge, and these other places?

MR. SEARS: The report takes the position, at least as I understand it, that Somerville and Chelsea have the responsibility to take care of their own gates.

Again, to be blunt, if these smaller cities find it hard going and if only the MDC can accomplish the result, then that is why we are in the tidegate business in Boston. And if the environmental community discovers that the only way we are going to prevent those salt water incursions is to have the MDC get into the act, we will need authority, money, and we will roll up our sleeves and go to work.

MR. STEIN: Let me ask you a question on this, because I don't think procedural matters such as a right of entry among public bodies should hold up a program. Isn't it possible for you to get right of entry, or for us to work it out here, where you won't have to go to your Legislature to do that?

That seems to me to be the hard way to get at something in order to accomplish what we all have considered and signed off on as an appropriate task -- repairing the tidegates.

MR. SEARS: The faster it goes, the better we like it.

MR. STEIN: I know, but what is the impediment to give you, as the State full access to the property?

MR. SEARS: There is an impediment all right, but it can be solved in several different ways. In the case of the gates we are working on now, it was solved by an agreement between the city -- between the Commission and the Mayor. It is far faster if we simply get the Legislature to come forth and say, "Hereafter these are your gates."

Mr. McMahon made a quite honest effort to get attention given to a gate on the Boston shoreline, and the Boston Public Works Commissioner wrote a letter saying, "Those are not my gates. That should be done by the Commission."

Mr. McMahon then addressed himself to us, and we said, "Those are not our gates. They should be done by the city of Boston."

There is an Attorney General's opinion which sheds light on a part of this problem and casts a little shadow over quite a bit of the rest of it.

My own personal reaction is that we should figure out who can do it best and go ahead and do it.

MR. STEIN: Well, it certainly would seem to me if we got the proper cooperation from all the jurisdictions this can be done by an arrangement, and it would seem odd if we needed legislation for this. I think perhaps that is the fastest way. You know your local situation and your State situation best. But I think if we are going to get at this problem we are going to have to decide, at least from the Federal point of view as I see it, who is responsible for each gate and how we're going to get at it.

But it also seems that this is a peculiar problem which should be able to be solved very, very rapidly if all the parties were of good will and they didn't interpose any objections to right of entry or responsibility for cleaning it up.

MR. SEARS: It isn't really quite completely a matter of good will. It is also a matter of who is paying the bill.

MR. STEIN: That's right.

MR. SEARS: And our constituents-- I was asked if I was squirming on my way up here. And I said, "Of course. Yes. I am the goose at this particular Christmas dinner."

But I am squirming in two ways. Sitting out there are some of the people who have to pay our bills, and they will want to know, "Why should I, if I am sitting in Woburn or in Reading, pay a bill for some tidegate way off in Boston Harbor? What benefits that me?"

We have to make that case back to them.

To let you know exactly how curious this situation may be, we do not know as we stand here who is supposed to maintain and operate these gates. The Attorney General's opinion is not particularly clear on that point. And the MDC at the moment has an option. We can either write a letter to the Mayor each time we finish a gate and say, "Okay, buddy, it's yours," or we can hang onto them and attempt to make sure that they are operating properly and then turn them back in batches or we can wait until the end.

Our counsel advised that we have all three of these options. The MDC has decided not to turn any of them back because we think for the moment that we can probably do the best job. So there is that type of good will present.

But there is also our responsibility and the Commission's responsibility to its stockholders, and we have to make sure we are explaining to them why we are using their money and what authority we have.

MR. STEIN: Mr. Sears, I wonder if you would permit me one more remark, because I was going to say that the difference between coming here in 1968 and now is like night and day. The problem is -- and I think Dr. Foster put his finger on this -- in 1968 there was a lot of concern about the conceptualism of Federal-State rights and jurisdiction rather than about the problem. I see we are addressing ourselves to the problem here, and I think this is the most wonderful thing that has happened recently, at least to me in going around the country, in seeing how we have gotten past that stage into the problem-solving stage in Boston Harbor.

Now that we have done that the hard way between the Federal and State people, I would hate to see this kind of conceptualism on jurisdiction get involved with the problem of repairing and maintaining these tidegates.

I think one thing is clear. If the tidegates don't work, you are going to have a problem in the harbor. We did set up a program to do this. The program is substantially behind schedule. And if what is going to hold us up is jurisdictional disputes rather than other ones, we are going to have a very difficult time meeting this.

MR. SEARS: Your tact and diplomacy in no way reduces the weight of what you have just said, and I think it is admirably phrased.

The MDC often forgets to tell people the curious way in which we are financed. The Legislature authorizes our expenditures, and that is why there is constant entreaty of them for a little help on Beacon Hill. But the moneys come from the real estate taxpayers of 43 cities and towns, and that is an extremely awkward situation for all concerned. Only 2.5 percent of our money comes from the general fund actually.

And so we live in this demimonde of always finding it necessary to explain to our people, who are even more harried I guess than the State's income taxpayers, why we are spending their money instead of sticking somebody else with the burden.

However, we can live with that. We have for 80-plus years. Most of the Commission have far more experience with it than I.

And I think that what you really are looking for is an expression of our desire to cooperate in this effort, and that I should like to give you wholeheartedly.

MR. QUARLES: Mr. Sears, I wonder if we could pursue a little further the exact status of your capability to carry out the tidegate improvement program. Have you got the funding that is required to complete the work on the 40-odd remaining tidegates?

MR. SEARS: Well, we are poaching a bit. Is the chief engineer still with us? Mr. Bergin, are you out there? Frank, are we in happy financial shape for the remaining 40? Or are we going to have to go back and beg again? We will have to beg to the Commission to approve some more contracts.

MR. FRANCIS T. BERGIN: We think we have enough money as things stand right now, Commissioner.

MR. QUARLES: And could you tell us-- First perhaps I should inquire for the record the name of the speaker.

MR. SEARS: Francis T. Bergin, Chief Engineer of MDC, Mr. Chairman.

MR. QUARLES: How many of the tidegates are covered by outstanding contracts?

MR. BERGIN: Right now I think there are 12.

MR. QUARLES: I think we are working on a base of some 72 overflow structures -- is that right -- that were identified in 1969 or have been identified since as being part of the Boston main drainage system? And am I correct in understanding that some 20 of these overflow structures were equipped with tidegate structures before you people began your program of fixing up those that did not have adequate equipment?

MR. BERGIN: The city of Boston through the BRA had repaired -- I believe the figure is nearer 12 than 20 -- and then the city of Boston on their own had repaired a few.

MR. QUARLES: Well, the report that we have before this proceeding indicates that as of July 19, 1971 there were 22 combined sewer outlets in the Boston main drainage system which were operational, six were under construction, and two were proposed for construction, and 42 were under investigation.

MR. SEARS: Some of those 22, Mr. Chairman, were operational because we had fixed them.

MR. QUARLES: So that some of the 22 are included in the 12 that you are referring to?

MR. SEARS: The other way around, but yes.

MR. QUARLES: Right. Are there 42 still which you have not yet begun on in the sense of having let contracts?

MR. BERGIN: We are investigating those.

MR. QUARLES: You are investigating those?

MR. BERGIN: Right.

MR. QUARLES: And doing the preparatory work before letting a contract for the work, for the actual installation of equipment to be made?

MR. BERGIN: That's correct.

MR. QUARLES: What is your time schedule for going ahead with that?

MR. BERGIN: Well, we are working on it every day.

A lot depends on what we find. These tidegates-- Well, we describe it in the office that these contracts are probably the dirtiest, rottenest, filthiest holes that we have ever been in, and some of them go along pretty smoothly. We get five or six of them together and put out a contract. So, like the Commissioner stated, a year from May is probably a little bit optimistic, but that's what we are shooting for.

MR. SEARS: We are shooting for that. Our programmatic deadline is a little bit uncertain. The way the authorization, appropriation process works in Massachusetts, we thought we had several million dollars in the recreation bond issue. However, it is possible for a subsequent legislature to come along and earmark funds that an earlier legislature authorized. So we never really know when it's Christmas and when it's not.

MR. QUARLES: I think this is going to require a good deal of further understanding on our part.

But, Mr. Pahren, you may have some other questions, and I will let you proceed with those.

MR. PAHREN: One of the recommendations of the staff report, specifically No. 6, indicates that the MDC complete the engineering report by September 1972 relative to future needs for the entire MDC sewerage system. I believe this is tied to the New England River Basins Commission study of the entire area. Have you initiated this study and does this have a relatively high priority in MDC?

MR. SEARS: This is the matter to which I referred when I said that in this case we don't think we can do it ourselves. We would like to be able to and save that money. But we feel the need of expert help, and so does the Water Pollution Division suggest it.

So that last year we asked for several hundred thousand dollars to launch this study. It is on that magnitude I think. And that measure, once dead but now perhaps reviving in the legislature, has not succeeded to date, so that we asked again in the supplementary budget, got again disappointed. We are going to ask again next year. We will just keep struggling to get those funds.

Some who have been in the Federal legislative arena may not know that in Massachusetts we have a legislative deadline. We cannot file a measure at any point all year unless we can get the Governor to file it as a special message. We have to get them in at the end of the year, and we clank along, and the budget usually comes with our funds attached about the middle of the following year.

So if we file now -- and the Commission is now considering a legislative package -- our best bet for getting funds to launch such a study would be June of 1972, and the deadline stated here is September 1972, which we suggest is shooting the moon.

We'd do our best, but it would be a rag-tag study on that schedule.

MR. PAHREN: This is this preliminary engineering report you referred to in your statement? Is that right?

MR. SEARS: In each case we would want to make a study followed by producing preliminary engineering report as requested by Water Pollution Division and by you people.

MR. PAHREN: Okay. This will be prepared by an outside research firm?

MR. SEARS: I believe so.

MR. PAHREN: Okay. Will the study be very broad? In other words, include everything? The efficiency of the existing waste treatment plants, possibly upgrading the secondary if necessary, the combined sewers problems, etc.?

MR. SEARS: Even broader. What we have just advised our stockholders is that we would like to study the whole question of whether regional sewer systems still work. What happens when septicity problems set in on 40-mile travel? Do we need subregional systems? Should they be built by MDC?

In short, I think we had better get ready for the next half-century. And I believe that to be the spirit of the inquiry. "Don't just go on doing what you're doing and add on a few more pipes and another plant, but think about recycling, secondary treatment, tertiary treatment." You know. It's time for us really to consider the next Deer Islands and Nut Islands, and maybe a completely different process may result.

MR. PAHREN: Good. Then the suggested date of September 1972 is unrealistic based on the existing state of the knowledge? Is that right?

MR. SEARS: I expect to be embarrassed.

MR. STEIN: The problem of the conferees is going to be establishing time schedules. That's our business. September 1972 just for the study is a long way off. And I think you have indicated something in your initial statement about if we considered further treatment necessary, such as secondary treatment, you might be receptive to it.

I think you have raised two points, Mr. Sears. One is this notion of whether you are going to go to a regional system. We have had experience now where we have recognized that in many cases, in large metropolitan areas, regional systems were the thing, because you can't put everything in the pipe and get it out to the ocean if you don't even have a river. The idea is to have clean water, and no water at all is almost as bad as dirty water.

And the other question is the question of the degree of treatment you are going to have.

What I am trying to get at is this. Recognizing your legislative problem, do you think it would be feasible for you -- and I guess you're part of the same system now -- and the Federal Government and the other people to try to work together and possibly come to some of those decisions before September of 1972 -- that is, on the degree of treatment and the notion of regionalization versus taking everything to a single plant?

Or do you think we would just have to wait until that optimistic 1972 date even to get the answers to this?

I think this is a key question that the conferees have to answer.

I think the magnitude of that study will indicate that the time between June and September is a very short one indeed. And perhaps it might be helpful to you and the State and the people in the metropolitan area and to the Federal people if we all had some kind of notion of what degree of treatment and whether you were thinking or we were all thinking in terms of regionalization or not, or little plants up the river with a high degree of treatment, or carrying this down, much before September 1972.

MR. SEARS: My marginal note on this item indicates -- Mr. McMahon can correct me -- that when we were caught on the hook of the Water Pollution Division he asked, having considered the budgetary problem, that we attempt to make the feasibility report by about the first of January 1973 -- let's say the last of December 1972 -- and to try to get the preliminary engineering report out by June of 1973 when we would have had more opportunity to get the consultant, get the famous "03" approvals, and arrange that the consultant go to work.

Insofar as our working with other interested parties and experts on the problems of the harbor, thanks to the good will of Messrs. McMahon and Brownell and thanks to the energetic efforts of Mr. Secretary to do the things he has said that he would try to do and bring us more and more together, I think we can assure you that that's our intention.

And thanks further to the beginnings of some very happy cooperation with Mr. McGlennon, we feel that we can work with your regional office extremely smoothly.

And I have no doubt but what these things will happen by their own accord.

We are greatly pleased that we are sort of off the question of "cops and robbers" and moving into the area where we know that we need your help and need advice from EPA and need advice from the Water Pollution Division, and we will be leaning on each other instead of shouting at each other I think. One hardly even needs to tell us to. It just makes sense.

MR. STEIN: I think we are all in agreement. Let me rephrase the question or put it as a specific question. The way you have put it forth, we are at least a year away from making a determination on degree of treatment and regionalization, even getting the report out. Do you think it is possible by working with the Federal people, our region, and your agency, perhaps to come to those judgments on degree of treatment and regionalization and put this out to the public and allow the feasibility report to come up with plans at that time to carry out the judgments that we have made on degree of treatment and the views we might have toward regionalization?

I think a lot of the plans have come up that way. In other words, the plans, for example, in Washington and the judgment to go not to one big plant in the metropolitan area of Washington around the District of Columbia but to have five small plants came before the studies were made.

Once the judgment was made that this was the way to go, they began looking for sites and having feasibility studies. Once they made the judgment that they had to go to tertiary treatment, then they set this out.

What I am suggesting to you is do you think it is possible to make these judgments before we have the feasibility studies, or do you feel we have to wait this full year before we even know which way you are going to go?

MR. SEARS: I see no reason why we should just sit around and wait for the authorities to hand down advice from on high. On the other hand, this is not really the answer that I wish I could give you. It does not to me make much sense to spend several hundred thousand dollars asking someone for their wisdom and then prejudge what they are going to report.

I got a report from a consultant a year ago who told me that I was absolutely dead wrong and could not do the thing I desired to do, and I was the happiest man in Massachusetts. It was perhaps a rare occasion for a consultant to tell a bureaucrat what he didn't want to hear. But I would hate the feeling that we hired a distinguished engineer or an expert on hydrology or on questions of water pollution and then pretty much told him that he had to decide in advance of his conclusion that we were going to fractionate the system.

Now your quick reply is, "Gee, buddy, they did it in Washington. What's so different with you?"

And my only answer to that would be that I would like as soon as we can to plug into the collective wisdom of the environmental community. If it has been shown over and over again that this thing works better another way, I think we could reach those judgments in a very early part of the study or even before the study commenced.

MR. STEIN: Yes.

MR. SEARS: But I would like to reserve judgment for that consultant, whoever he may turn out to be, to tell us at the end of his study that we were wrong.

MR. STEIN: Yes. Mr. Sears, I don't want to push this, but sometimes these judgments-- It may not be worth spending the public money or the time to ask a consultant to come up with what is an obvious social conclusion that can be made beforehand. And I'm not saying that that's the case here.

But I think we have two things -- either prejudging or paying for reaffirmation of the obvious. And I'm not sure that we can't possibly come to certain conclusions much earlier than a year away from here on some very fundamental issues.

MR. SEARS: I think that's possible.

MR. STEIN: All right.

MR. SEARS: If you look at the map -- and one should not be having this conference and I should not be talking without a map up here -- you will see that the Lord has put two hooks out into Massachusetts Bay, one Lynn and Nahant, the other Cohasset and Hull. And I have always had the feeling both of those areas could be used if we are going to continue with our ocean disposal.

Both of those communities are actually on implementation schedules now to build their own individual plants. And this is a matter that really should be resolved collectively in the environmental community after a political and social judgment as you describe it.

We will go as fast as we can.

MR. PAHREN: Let me ask a question about one of the comments you made in your presentation. You mentioned the new rules and regulations that MDC recently put out. Could you tell me your procedures for enforcing these regulations, what the penalties are, and what you would do if you found that someone put some oil or toxic materials into your sewerage system?

MR. SEARS: I will answer on two levels: One, what can we do now? Two, what do you all seem to want us to be doing? And what we'd like to do that will help.

What we can do now is to put the arm on any member community, our selfsame stockholders. If they are discharging toxic or unacceptable substances into our sewer system, we have been given a limited regulatory power. We may increase the sewer assessment against that community plus decreasing the sewer assessments against other communities up to a certain fraction of a percent or $200,000 a year.

That is a very limited authority and rather hard of enforcement.

And we have a small inspectoral force attempting to keep tabs on what goes into our system -- too small in your judgment and in ours.

Therefore, I am asking in the current sewer budget if we may have some more inspectors, some laboratory technicians, and some equipment with which to make sure that these discharges are not occurring.

But it seems to me that what you want us to do is attempt to enforce against the polluter. And our power is only against the community. It's indirect.

So we must now, as I said in my remarks, go back to the selfsame General Court and ask them to give us the "moxie" so that we can bring actions directly against the industrial polluter or the municipal polluter for that matter.

MR. QUARLES: And you plan to do that? You have a bill prepared for submission before December? Or do you plan to do that?

MR. SEARS: We will be yelling our heads off hoping to get that power in the next legislature.

MR. PAHREN: Do each of the member communities have strict sewer ordinances to prevent this right now or not?

MR. SEARS: We think that a good many of them have adopted the basic model sewer regulations set forth by the water pollution authority. In fact, we have just at our sewer users' meeting made this point to them and told them where they can get models. I guess we put some pressures on Mr. McMahon's clerical staff, and we hope if there are communities that have not yet updated their regulations that Tom will be hearing from them shortly.

MR. PAHREN: Okay. I would like to pursue a little further a question that I asked before you came here this morning, and this concerns the Nut Island plant. I appear to be a "nut" with regard to that plant. (Laughter)

But it's my understanding that the flowthrough capacity is about 350 mgd. Is that about right?

MR. SEARS: I would say you're on the wrong island at the moment.

MR. PAHREN: No, I am talking about flowthrough, hydraulic capacity, not the 112 design capacity.

MR. SEARS: Okay.

MR. PAHREN: Okay. Now isn't it true that during certain heavy rainfalls the total flow may exceed the hydraulic capacity -- in other words, be more than 3 times the design capacity for the plant?

MR. SEARS: Yes.

MR. PAHREN: Then my next question is what happens to the excess flows?

MR. SEARS: Let's see. We don't have Mr. Giddons with us today, do we? Who wants to knock that question out of the park? Mr. Hayes, I think I had better let you designate the respondent.

MR. HAYES: My name is Allison Hayes, Director and Chief Engineer, Sewerage Division, MDC. The capacity of the influent sewer to the Nut Island plant is, as you say, roughly 300 mgd. With a certain amount of surcharge, probably that capacity is exceeded to a minor degree.

But if that is exceeded to any great amount, there are overflows not at the treatment plant but up along the sewer line. And there is where your excess flow is discharged. It never gets to the plant.

MR. PAHREN: Does the plant itself have a bypass capability if someone wanted to turn a certain valve? Or is it bypass-proof?

MR. HAYES: We can actually bypass the whole plant by not letting any flow into it. But it is still controlled by the capacity of the influent sewer.

MR. PAHREN: Okay. Now, when the plant receives its maximum flow that is hydraulically possible, what is the detention time at the plant? And also how does that compare with the designed detention time?

MR. HAYES: At 350 mgd your detention time is about 35 minutes in the sedimentation tank.

MR. PAHREN: Compared to what at, say, 120 minutes?

MR. HAYES: 90.

MR. QUARLES: Am I right in thinking that you seldom or never have reached the maximum of the 350 mgd?

MR. HAYES: Oh, yes, we have.

MR. QUARLES: You do reach that?

MR. HAYES: Oh, yes.

MR. QUARLES: With what frequency?

MR. HAYES: Well, send a hurricane up to us, 5 or 6 inches of rain, something of that intensity.

MR. QUARLES: Would you guess that you reached that level --

MR. HAYES: We had 14 inches in one of the hurricanes. Everything is full.

MR. QUARLES: On a yearly basis you would expect that there would be several occasions on which you would reach that level?

MR. HAYES: Not particularly. Perhaps once a year, but --

MR. QUARLES: Do you have any judgment or any actual evidence as to the degree of removal of oxygen-demanding substances which is achieved when you are running the full hydrologic capacity at 35-minute detention?

MR. HAYES: Those figures would be available, because the analysis of the testing goes along all the time. At 300 to 350 mgd I'd say somewhere between 25 and 30 percent, maybe 28 percent, removal.

MR. QUARLES: You have 28 percent removal at that flow?

MR. HAYES: Yes.

MR. QUARLES: What percent removal would you have at 112 mgd, which is the designed capacity?

MR. HAYES: 35 or 36 percent.

MR. PAHREN: Mr. McGlennon indicated he had a question.

MR. McGLENNON: Mr. Sears, on the subject of this sludge disposal from Deer Island and Nut Island, the Hydroscience report on June 4 recommended a study of alternate sludge disposal be commenced immediately, as I understand it, by the MDC. Is that correct?

MR. SEARS: That is correct.

MR. McGLENNON: Has the study been commenced?

MR. SEARS: We got a letter from your good self or your office -- I think it was from you -- and another letter from Mr. McMahon, and I at that time established the environmental task force in the MDC. The chairman of it is Mr. Weiss, who is the superintendent of the Deer Island treatment plant. Other members include the superintendent of the Nut Island plant and several people from the Construction Division, including a sewer planner, and a gentleman who is working on the Neponset River because we continue to think of this as a collective problem not all derived from any one source.

They have been studying the problem ever since your letters arrived. They are, in fact, the people who will generate the study called for in this joint statement.

They have now, thanks to the courtesy and cooperation of the Water Pollution Division, been enhanced and reinvigorated by having some people from Mr. McMahon's staff join with them, and they will be reporting to us before very long I hope.

I had established a private deadline of June 1972. I think yours came along as April. So we just simply brought ours forward to meet yours. We are hoping Mr. Weiss and his colleagues will have a report for the environmental community instead of just for the Commission at that time.

MR. McGLENNON: Our recommendation actually was June of 1972. Your memorandum of agreement with the Division of Water Pollution Control says April 1, does it? April 1, 1972? Does April 1, 1972 continue to be a realistic date for the completion of the study?

MR. SEARS: Since in that case we are doing it with our own engineers and our own chemists and we don't need to go beg for money and get authorizations, I think this is a fair deadline, and the task force thinks so too. We will try to deliver.

MR. PAHREN: Incidentally, our staff report suggested a research firm. Is your task force looking at the various alternatives broadly enough so as to consider all feasible alternatives?

MR. SEARS: We hope so, but there again we may need your help. It helps so much when you don't pretend that you are in a vacuum. The fact that Washington is moving in one direction is of interest to me.

We are going to look at burning, and we are going to look at pyrolysis, and we are going to attempt to catch up in house with the latest scientific knowledge of this particular problem.

I think it really rather good that the result will be that there is a corps of people within the agency that will be there for years and years after I have been washed out in the outgoing tide who will think about these things and react to these things and care about them. And so, on the whole, I think it is a happy arrangement.

MR. PAHREN: Okay. The preliminary report will also be carried out by your own people?

MR. SEARS: No. I think that to make a preliminary report we will need to go outside and get help.

MR. PAHREN: That's all I have.

MR. QUARLES: Mr. Sears, could I ask you for a little further indication of the situation concerning Moon Island? I believe you indicated that in that case there where the current practice as I understand it is that raw sewage is being discharged on the outgoing tide-- Did you indicate that that is expected to be eliminated in 8 months?

MR. SEARS: Mr. Chairman, it's not quite fair of me to do this to you. Our hangup in this area comes from the fact that we -- and I think Secretary Foster shared it -- had a concern about the environmental damage we might be doing in Black's Creek. Our concern led us to appeal to the National Park Service for their advisements, and they have not delayed at all really. But in our effort to make a proper master plan for the end of Furnace Brook and Black's Creek we held up the Squantum force main project.

We held it up, in fact, until the Park Service report arrived a week or so ago, and we are now vigorously planning, including planning the completion of the Squantum force main project as fast as we can, having a sort of a green light.

The entire system is built except for 400 feet. And then we come to the mouth of the brook, and we didn't know whether we could culvert it in a different place or bridge it in the same place or what was most desired to retain the ecology of a brackish and extraordinary marsh.

MR. QUARLES: You think you have that answer now and you are proceeding to go ahead?

MR. SEARS: Indeed we are.

MR. QUARLES: What is your best estimate of when you expect that to be completed?

MR. SEARS: Incidentally, Mr. Chairman-- Well, June of 1972 is the estimate that I have thrown forth at you. Moon Island is really Commissioner Casazza's baby, and I have no business talking about his plant or his activity there. I believe that if he wanted to he could close it rather independently -- but with unfortunate results.

I would refer some of the case-in-chief to him with respect to this particular facility. All I can say is that we have designs that are ready, and we have 400 feet of 30-inch piping to put in, and we think we can get that accomplished by next June.

MR. QUARLES: Do I take it that this is one problem which is interrelated with other problems concerning Calf Pasture pumping station? Or is that the whole problem there?

MR. SEARS: No, there is another very major problem there.

MR. QUARLES: And the solution of that other major problem is the problem that in the 1969 recommendations it called for completion by March of 1972? Is that right?

MR. SEARS: We are struggling -- I may not have been responsive, and I hope you will just bang the gavel if I haven't been -- we are struggling to try to take care of what I think is perhaps the highest priority pollution threat to the harbor of all; namely, the outfalls drooling onto the five beaches in South Boston and Dorchester.

That involves a judgment as to whether we draw storm effluent toward Calf Pasture and perhaps build a treatment and detention station there and put it out into the old harbor which is SB, or whether we draw it across South Boston and put it into the reserve channel, having treated it, which is SC.

A very, very difficult and sensitive public problem has arisen. The last good public rubdown I got was in a public hearing in South Boston when people told us how very little indeed they liked the idea of going ahead with this project. And that antipathy has been reflected in legislative chambers.

We are a little bit stuck to know in which direction to proceed there. And we are partly at fault because our own headworks at Columbus Park has an odor problem which we have struggled and struggled to solve. Until we can really get rid of "Petunia, the skunk" I think that the people there are quite naturally going to be incensed at the idea of any further plumbing.

All I can say is that Mr. Hayes and Mr. Bergin have labored on it. I have made some rather angry telephone calls at about 2 o'clock in the morning upon occasion to get that headworks to smell a little better.

I don't think we can completely solve the Calf Pasture problem until we can nail down what is our next logical step in terms of those old harbor outfalls.

MR. QUARLES: I think we are drawing toward the luncheon hour. I would like to not focus further on some of these difficult individual problems but talk with you a little bit in a general way on the subject of where we find ourselves dealing with pollution problems of Boston Harbor.

I confess I have a good deal of ambivalence, having heard you testify this morning or make your comments. I have no question in my own mind as to your own sincerity or as to your competence, and I am sure Massachusetts is fortunate to have a person of your background and your caliber in the job you now hold.

I have also been continuously impressed not simply in Massachusetts, although I think it is clearly true here, but as I have gone to other States around the country, by the caliber of people who are working on these problems at the State and municipal levels.

And yet we find ourselves with a great amount of pollution around this country, and the problems not solved. Very commonly, the problems that are holding back doing the job may be problems which the people in the State agency or in the municipal agency cannot solve by themselves.

If there is fault for the situation that we have, the fault is not to be attributed to the dedicated people who have been trying to solve the problems but lies more generally in the public at large which has been much too slow in waking up to the problem.

I have frequently heard my good friend, Murray Stein, give the analogy that if you are flying from here to Los Angeles and it is a 3-hour flight, you may leave late by any amount of time but it is still going to take you 3 hours to get there.

The thing that concerns me is whether we're flying at full speed. And I'm not sure from what I have heard from you that there is any basis for confidence that we really are flying at full speed, notwithstanding the fact I am perfectly persuaded that you are doing everything you can do personally and others here present today also may be doing everything they can do personally.

As Federal enforcement officers, we have serious problems of how we will proceed when we look at a situation where those locally responsible are making a good-faith effort but, notwithstanding their efforts, substantial delays have occurred and violations occur.

As you well know, one of the main emphases which Bill Ruckelshaus has given to the Environmental Protection Agency, in accordance with the directions from the President, is that we should present and carry out a vigorous enforcement program. The only way that the pollution problems of the country are going to be resolved is if firm deadlines are established and then those deadlines are enforced.

As we look at the record, at the deadlines that have been established with regard to Boston Harbor, the deadlines have not been kept. One example we were just discussing involves Moon Island and Calf Pasture. Under the 1969 recommendations established at that time, that was to have been solved by March of 1972, and I gather from what you say, although one segment of it may be solved during 1972, the overall problem is going to wait a great deal longer. We really don't know where we are headed.

If you look at the tidegates in the city of Boston, Bostain main drainage system, a deadline of May 1971 was established. May 1971 has come and has passed, and only a minority of the tidegate structures that were required have been installed.

Now I take it you are hopeful that this job can be completed 2 years later, but without even a clear confidence that that timetable can be accomplished.

Perhaps of greatest concern are the overall problems that require further study of the sludge disposal and then the greater subject of where we go from here for the harbor as a whole.

The 1969 recommendations stated that a consulting firm would be engaged by the Commonwealth to make a general study, including recommendations for sludge disposal. It specifies that "this report shall be completed by the winter of 1970-71 and an implementation schedule incorporating the approved recommendations shall be developed directly thereafter."

Now I would interpret "directly thereafter" as probably having already occurred. But from the picture as it comes to us here, you are still waiting for money to carry out this study, and there is no clear indication of when the report will be completed.

Disposal practices for sludge that are now being followed without question contribute seriously to the degraded condition of Boston Harbor. And it's this element of delay, and delay as to when actual work is going to be done to change the practice, which is of concern.

In the discussion that you had with Mr. Stein concerning trying to zero in on some basic judgments that can be made as to levels of treatment that are required and the direction in which the program is heading, I was encouraged by your comments, and I would simply like to underscore some of the basic points that Mr. Stein perhaps only hinted at.

The time is here I'm sure when it's necessary for the Metropolitan District Commission and the Commonwealth of Massachusetts to face up to the very real prospect that secondary treatment will be required in the Boston Harbor disposal system. Around the country there are few, if any, cities which are comparable in size to the Massachusetts situation where they do not already have secondary treatment or, if they don't have it, are at least on a program to install it. In many places they are moving to much higher levels of treatment.

Those situations are not directly comparable, I recognize perfectly clearly, as to the need for the treatment, but the national policy is developing very clearly and very strongly that minimum reasonable treatment is required without in all cases having to complete the uncertainties of proof as to where the need lies. Certainly secondary treatment for municipal wastes is one of the clear rules of thumb that is emerging.

The Environmental Protection Agency this past summer issued regulations providing that, in the construction grant program, construction grants cannot be awarded if secondary treatment is not being installed. So that unless the greater Boston system is going to secondary treatment, it would not be able to receive Federal grant assistance, which now stands at 55 percent and I'm sure will be an important factor in future planning for this area.

I am concerned that if we were to wait until you probably could get the funds in June of 1972, and then a study began, and then that study runs for a long period of time, and then you begin the public debate, we could be years away from an actual decision as to the course to be followed.

While I am not by any means here saying that secondary treatment now could be decided upon, I think that delay in facing that question and delay in making a decision on it can't help but be contrary to the best interests of this State and Boston Harbor.

My personal feeling is that I will be -- again speaking clearly only personally -- quite surprised if a conclusion ever is reached that secondary treatment is not necessary in this situation.

We have in Boston Harbor one of the most serious situations of urban pollution in the country -- with an antiquated system for collecting the wastes and bringing them into the treatment plants, with primary treatment plants, unsatisfactory sludge disposal practices, and a lot of work that needs to be done which in many cases is well behind the schedules that have been established.

I think in this situation the Federal enforcement officials are faced with a very serious dilemma as to whether they in good conscience can sit by when the Federal standards are being violated.

We want to work in a cooperative way. I believe that very frequently, without getting into the defensive relationships that arise in adversary proceedings, much more can be accomplished simply by people who share a common goal working together in a cooperative way.

We have such a good spirit of cooperation now. We have received such superb cooperation from the Massachusetts Department of Natural Resources -- and I hope that we have provided comparable cooperation to them -- in preparing for this conference that I would hate to see that destroyed.

But the Environmental Protection Agency is going to be keeping an extremely close watch on what develops here within the next several months. And we are going to have to be looking in the executive session of this conference at specifically spelling out what remedial actions can realistically be accomplished within the next several months, so that we can have a clear record of accomplishment or default and the facts will speak for themselves upon which we can consider whether some Federal enforcement action is required or can be omitted.

The real burden in this situation in my judgment clearly falls with the general public. I don't believe the general public has any understanding at all of the inadequacies in the present system and the need for more vigorous action.

I wish I could have more confidence that you are getting from the general public the support that you need to do your work. I hope this conference may contribute to that.

But it is perfectly clear to me that unless there is strong leadership throughout the general public and the communities that are represented here, and their local leadership, this work isn't going to be done, and we are all going to regret it very much.

MR. SEARS: Mr. Chairman, if I may make a very short comment upon -- and not a rejoinder to but rather a statement in support of -- what you just said, the fact of the matter is that we I think will take -- I certainly will take -- most seriously the remarks that you have just made. I hope that they go right where you had intended them to go as well as to me and to my colleagues on the Commission, also to our colleagues in government and to the public.

It is true that the MDC has a problem with secondary treatment. For 82 years we have assumed that we were providing open ocean disposal. And we are startled really to learn that standards that are applied to inland communities may also be applied perhaps without some sophistication to us.

Secondary treatment for us is in the order of $40 or $50 million. If we are to attack the combined sewage problem, we are talking of $600 million. And we are dealing with 43 rather strapped Eastern communities.

We need your pressure. We need your vigor. We need your spirit. And we are going to need your help. It will not work otherwise.

I think where we talk of the evaluation report that was due that we have the right sheriff but the wrong hombre." It was not our agency that was actually told to provide that report.

The tidegate deadline I must confess seems to me a misprint, because I thought actually our deadline was not 1971 but 1972. But we missed it. And I would miss the point of your remarks if I were to say otherwise.

I will conclude by saying that your address to the public is one that I would like to second. In fact, the tragedy of this whole problem is most graphically illustrated by the difficulties in Calf Pasture and Carson Beach where I have been told, Mr. Chairman, that until we actually close those beaches we cannot get the public sympathy which will lead to the public support which will lead to mobilizing the men and money that we need to solve the problem.

I don't believe it. I think that with your efforts and with those of Secretary Foster and my colleagues, Commissioner Brownell and Mr. McMahon, and Mr. McGlennon in your office here in the New England Region, and thanks to the illumination that you all have cast on these problems, we can get there, and I hope that we will do so speedily.

MR. QUARLES: Thank you.

We will reconvene at 2 o'clock.

(Whereupon, at 12:30 p.m., the conference was recessed, to be reconvened at 2:00 p.m., this date.)

AFTERNOON SESSION

2:10 p.m.

MR. QUARLES: The meeting will come to order. We are now in session.

Mr. McMahon, I will turn it over to you to proceed with the presentation of additional presentations.

MR. McMAHON: Go ahead, Commissioner Brownell.

MR. QUARLES: Mr. Brownell.

MR. BROWNELL: Mr. Chairman, two individuals who will make statements have asked us if they could be heard earlier. I would like to now call upon Guy McLeod, Director of Research of the New England Aquarium.

STATEMENT OF
GUY C. McLEOD
DIRECTOR OF RESEARCH
NEW ENGLAND AQUARIUM
BOSTON, MASSACHUSETTS

DR. McLEOD: My name is Guy McLeod, Director of Research of New England Aquarium and an adjunct professor of biology, Boston University.

I would like to take this occasion to comment briefly on the progress we have made on a joint effort with the Department of Natural Resources on a study of the quality of water in the Boston Harbor. This program has been underway for a year.

The first year we looked at primarily water quality variables in the harbor, method of data storage and acquisition. This coming year we are looking at sediment deposits in the harbor, metals, and developing a biodynamic model for the harbor itself.

The first part of the study was used to verify the Hydroscience report that has already been commented on, as well as to develop a reasonable system for data storage for the State of Massachusetts and easy and logical retrieval.

The current efforts of the program are to look at the metallic deposits in the harbor. To this end we have looked at, within the last month, zinc, lead, copper, cadmium, cobalt, nickel, mercury, and vanadium. I can say that these values are in the part-per-million range in the water column both vertically and horizontally distributed and may be an order of magnitude greater in the water-sediment interface and perhaps even five orders of magnitude greater when one looks at and extracts biological tissues.

The case of mercury is particularly interesting because the percent recovery of organic mercury from either plant or animal tissues is a very difficult and tedious process. We now believe we have a 92 percent recovery.

And in shellfish collected in and around the Boston Harbor area we can report as high a value as 150 parts per billion.

We will be taking cores in various areas of the harbor during the winter and in the spring and analyzing the distribution of metals throughout the vertical section of the cores.

Finally, we have ready in its preliminary stages and subject now to verification a biodynamic model of the way the harbor operates, and particularly the influences of various outside inputs upon the biology and chemistry of the harbor.

Thank you.

MR. QUARLES: Thank you very much, Dr. McLeod.

MR. BROWNELL: Thank you.

Mr. Chairman, the next person I would like to call upon is Mr. John P. King, Associate Commissioner of the Massachusetts Department of Public Works.

STATEMENT OF

JOHN P. KING

ASSOCIATE COMMISSIONER

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BOSTON, MASSACHUSETTS

MR. KING: Thank you, Commissioner.

Members of the jury and ladies and gentlemen, I appreciate the opportunity this afternoon to apprise you of a new program upon which the Department of Public Works has embarked. Because of the infancy of the program -- being less than a year old statutorily and a little over a week old financially -- my remarks are going to be very, very short.

Everyone realizes that water pollution manifests itself in many ways. Perhaps one of the more visually tangible forms is that of floating debris. Although this is undoubtedly not the most detrimental form of pollution, it nevertheless is significant in Boston Harbor.

Toward alleviating this problem, the Massachusetts Department of Public Works filed a bill with the legislature 2 years ago and was successful in realizing the passage of this bill on December 1, 1970, less than a year ago.

This law, Chapter 878 of the Acts of 1970, authorizes the Department of Public Works to exercise significant jurisdiction over the dilapidated, unsafe waterfront structures that are the source of floating debris.

The success of this program is almost mandatory. It is funded by a dedicated fund derived from a percentage of the gas tax. It permits the Department to remove any structures if not satisfactorily accomplished by the owner after notification and take a lien on the property.

Initial funds have just recently been appropriated, and some of the owners of the 190 dilapidated structures have been notified of our intent. We expect that it will take 10 years to clear Boston Harbor of this problem. I wish the same degree of success to those of you engaged in eliminating other forms of pollution that I am confident the Department of Public Works will achieve in this program.

Thank you.

MR. STEIN: Do you think it is going to take us 10 years too?

MR. KING: I do think it is going to take 10 years. We have had a study -- or a study has been made -- by the Corps of Engineers. On today's costs it is approximately $11 million. And at the rate of the percentage of the gas tax that we receive, realizing also that our commitment is not just to Boston Harbor but to the entire Commonwealth of Massachusetts and the inland waters, we think that $7 or $8 million could be forthcoming for tne use of Boston Harbor, and this will take a 10-year period.

MR. STEIN: For you. I hope it doesn't take that long for us.

What do you do with this debris when you gather it?

MR. KING: At the present time the only source of disposal for this debris would be to take it to sea and burn it in barges.

MR. STEIN. You know we had this problem with the great rehabilitation you have downtown. They told us that the only place you could dispose of the debris from the rehabilitation was to take it out in barges in the harbor and burn it.

When I see these new concrete formations going up as I pass from the airport now, I hoped that was over. Are you telling us that we are going to have to do this again?

MR. KING: Not do it again but continually until such other form of acceptable disposal --

MR. STEIN: You don't mean at sea. You mean take it out in the barge in the harbor and burn it?

MR. KING: I mean at sea. Outside the continental limits.

MR. STEIN: Why don't you tell us --

MR. KING Outside the territorial limits of the Commonwealth of Massachusetts, where it is transpiring now.

MR. STEIN: I didn't know that the Commonwealth of Massachusetts had any territorial limits.

MR. KING: They most certainly do.

MR. McGLENNON: Do you have to get a permit from the Corps of Engineers --

MR. KING: Yes.

MR. McGLENNON: -- to barge that material out?

MR. KING: Yes.

MR. McGLENNON: Does anybody else have to approve that permit?

MR. KING: No.

MR. STEIN: In other words, you don't think your burning will create the complaints we got from the burning of the rehabilitation program from people around the area?

MR. KING: I think that burning program will be a continuous source of complaint, as it has been from its inception. However, you have to weigh certain priorities. The material exists, and it has to be disposed of.

MR. STEIN: Yes. Well, where are you going to burn it?

MR. KING: Outside the territorial limits of Massachusetts.

MR. STEIN: Where is that?

MR. KING: It is 3 miles off the coast.

MR. STEIN: But the people in Massachusetts are going to complain about that burning off the territorial limits?

MR. KING: That's correct.

MR. McCLENNON: But they can't stop it.

MR. STEIN: I'm not sure they can't stop it. You know, every time I come up here I am amazed when we talk about the territorial limits of Massachusetts.

MR. KING: All right -- the territorial limits of the United States. They are one and the same line.

MR. STEIN: Yes, but here is a problem that we have. And I am all for the rehabilitation program you have. But one of the complaints we have had on the urban renewal program in Boston has been the burning of the debris and the complaints of the people about the smoke. You are indicating if we get this debris from the harbor we are going to keep continuing that? Is that correct?

MR. KING: That's correct. At this time.

MR. STEIN: All right.

MR. PAHREN: I have a question. Will you be interpreting "floating debris" to include floating oils that might appear on the water?

MR. KING: When the program becomes more sophisticated, yes.

MR. QUARLES: Any other questions?

(No response.)

We thank you for that statement.

MR. McMAHON: Mr. Chairman, I would like at this time to introduce Arthur W. Brownell, Commissioner of the Department of Natural Resources.

MR. QUARLES: Mr. Brownell.

STATEMENT OF
ARTHUR W. BROWNELL
COMMISSIONER, DEPARTMENT OF NATURAL RESOURCES
COMMONWEALTH OF MASSACHUSETTS
BOSTON, MASSACHUSETTS

MR. BROWNELL: Mr. Chairman, fellow conferees, ladies and gentlemen. I am Arthur Brownell, the Commissioner of the Massachusetts Department of Natural Resources and Chairman of the Massachusetts Water Resources Commission.

Since the last conference, Mr. Chairman, on Boston Harbor and its tributaries, held in April of 1969, the Massachusetts Department of Natural Resources has, in a very substantial way, become more deeply involved in Boston Harbor and its environment.

Arthur W. Brownell

Of specific interest -- and I consider of significant importance -- are the contributions of our Division of Water Pollution Control, which you will hear about later from Director McMahon, and the studies of our Division of Marine Fisheries, and also landmark legislation directing the Department to acquire certain harbor islands or parts of islands for the purpose of recreation and conservation.

Events leading up to this latter action were the deliberations, conclusions, recommendations, and draft legislation of a special commission established under Chapter 86 of the Resolves of 1966 and continued by the Resolves of 1969. This commission became known as the Boston Harbor Island Commission.

A report addressed to that commission was prepared by the Harbor Study Group, Massachusetts Institute of Technology, entitled "The Harbor Islands." That report considered several alternatives and, like other reports, recommended island acquisition by the Commonwealth.

Subsequent action by the commission consisted of its own report and its draft legislation, which was referred to our Committee on Natural Resources in the Massachusetts Legislature.

On August 22, 1970 Governor Francis W. Sargent signed into law Chapter 742 of the Acts of 1970. This act designated the Department of Natural Resources to be the acquiring agency of the privately-owned islands in Boston Harbor. The act is noteworthy in several respects, not the least of which is the funding agreement and arrangement. The Department of Natural Resources is authorized and directed to expend some $3.5 million for acquisition, development, redevelopment, construction, and improvement of outdoor recreation areas and associated facilities on lands acquired or transferred to it by the act.

The act is also unique in so many ways in that it gives the Department of Natural Resources the authority, the regulatory authority, on all alterations of lands within Boston Harbor as defined within the act.

Of the various agencies, institutions, and organizations that participated in prior plans, the Metropolitan Area Planning Council, with a plan in which it was a major participant, its built-in staff of professionals in the field, and its record of realistic and viable plans and programs, seemed the logical agency to assist the department in fulfilling the mandate of the General Court. The Metropolitan Area Planning Council was in a position to build upon already developed plans for the Boston Harbor area, utilizing them as points of departure.

Arthur W. Brownell

This Metropolitan Area Planning Council, along with the Metropolitan District Commission and the Department of Natural Resources, had compiled and published a four-volume series entitled "Open Space and Recreation Program for Metropolitan Boston." Volume 2 of that series is labeled "Boston Harbor."

Although the Metropolitan Area Planning Council's report was not specifically directed at or limited to acquisition and development of the harbor islands, much of the material and some of the conclusions of the triple-effort report needed merely an updating to be useful in connection with the current plan.

The Department of Natural Resources selected the Metropolitan Area Planning Council as its contract agent for preparation of the comprehensive plan under the Department's general guidance.

Representatives of certain agencies and organizations were invited to participate as a project advisory committee to work with the Department and the Metropolitan Area Planning Council in the formulation of the comprehensive plan. It was our desire to form a committee representative of the various immediate interests and skilled in certain disciplines and yet small enough in size to be a truly workable unit.

Arthur W. Brownell

Each of the following were asked to participate in the study:

City of Boston
City of Quincy
Town of Hull
Town of Hingham
Town of Weymouth
Town of Braintree
Town of Winthrop
Environmental Protection Agency
New England River Basins Commission
Corps of Engineers
Massachusetts Department of Public Works
Metropolitan District Commission
Massachusetts Port Authority
Massachusetts Bay Transportation Authority
Massachusetts Division of Water Pollution Control
League of Women Voters of Boston
Sierra Club
Massachusetts Bay Yacht Clubs Association

Some 26 islands have been identified as being in the harbor area as defined by the legislation; 13 of these are further identified as being totally privately owned and currently are being appraised by qualified appraisers under contract to the Department of Natural Resources, aside from the MAPC involvement.

It is interesting to note that the Bureau of Outdoor Recreation in the U. S. Department of the Interior is involved in the planning effort and in future acquisition and development of the harbor islands. In May of 1971 the Bureau of Outdoor Recreation approved funding assistance for the planning phase and indicated future assistance when the actual acquisition and development stage was reached.

I mentioned previously that our Division of Marine Fisheries was active in the Boston Harbor area. I should add, too, that our Division of Law Enforcement on a day-to-day basis is actively involved with its role in the enforcement of laws, rules, and regulations pertaining to finfish, shellfish, and water pollution control.

We are particularly proud of our marine fisheries' accomplishment.

Our Division of Marine Fisheries has conducted various scientific pursuits in Boston Harbor, the major effort being estuarine research studies. These studies are being conducted on various estuaries along the Commonwealth's coastline. Their goal is to evaluate the physical and chemical condition and the marine resources of the estuaries. These areas are exceptionally productive areas, rich in marine fisheries and related resources with great commercial and recreational value.

To date, the following estuaries in Boston Harbor have been studied:

1. Quincy Bay --- printed, copies available.
2. Dorchester Bay --- being printed.
3. Hingham Bay --- fieldwork complete, and now the proofs are being undertaken and should be ready to be printed very shortly.

The objectives of these reports are as follows:

1. To provide comprehensive information concerning the current condition of the Commonwealth's inshore fisheries.
2. To determine the factors responsible for the decline of the fishing industries in certain areas.
3. To suggest methods of developing or improving local marine fishery production.

The Department of Natural Resources, Mr. Chairman, is looking forward to continuing involvement on even greater scale in Boston Harbor and its tributaries. We are looking for cleaner waters, quality shellfish, better fishing, expanded recreational facilities, and more appealing open space areas for the quiet enjoyment of all.

In short, the Department of Natural Resources is very happy to be a part of an integral team working toward the enhancement of one of Massachusetts' greatest natural resources, Boston Harbor.

Thank you, Mr. Chairman.

MR. QUARLES: Thank you, Mr. Brownell. That is a most interesting statement, one in which I personally take some special interest, because I was in the Department of the Interior at the time when some of the attention was being given to this proposal, although I know it has been in the works for a long time.

Certainly this type of use of the islands is in keeping with the general island study conducted by the Bureau of Outdoor Recreation on a nationwide basis.

It is extremely desirable to take advantage of the few remaining opportunities to preserve open space land particularly close to the urban areas where there are large population masses, and in many cases islands provide unique opportunities that are not presented by the onshore land.

I would like to ask a couple of questions, if I could, just to get a better understanding of this.

MR. BROWNELL: Yes, Mr. Chairman.

MR. QUARLES: There are, you say, 26 islands that are identified. Does that include essentially all of the islands that one would see looking at a map of the harbor?

MR. BROWNELL: Yes, it does, Mr. Chairman. Right.

MR. QUARLES: The islands which are privately owned I gather will be acquired on a mandatory acquisition basis by condemnation if necessary or purchase if possible in advance?

MR. BROWNELL: The legislation spells out that the department can acquire those islands that are privately owned, and we are, as I stated, in the process of doing this and hope to accomplish this in the very near future.

MR. QUARLES: What about the other islands?

MR. BROWNELL: The other islands are publicly owned by the city of Boston or by some of the other towns in the Boston Harbor complex itself. The legislation spells out that these islands should be used in accordance with the intent of the legislation.

So as long as the islands owned by the city of Boston and the MDC are used for conservation and recreation purposes I see them staying in the hands of those public agencies.

MR. QUARLES: They will stay in that ownership and management?

MR. BROWNELL: Yes.

MR. QUARLES: But be used in conjunction with the same purposes as the other islands?

MR. BROWNELL: Yes, sir. Right.

MR. QUARLES: I don't know if you know this. What is the total acreage of all of the islands put together?

MR. BROWNELL: I don't know, Mr. Chairman, offhand. I believe as far as the 13 islands, they are somewhere in the neighborhood of 140 acres -- privately-owned islands.

MR. QUARLES: Are there proposals for any boating or ferrying methods of transportation for members of the general public to have access to the islands?

MR. BROWNELL: This is I think one of the prime concerns of ours and the Metropolitan Area Planning Council in their deliberations right now on the comprehensive plan for the harbor islands.

I think that we can provide the areas, the recreation areas, out in the harbor islands, but the problem is getting the people there.

Working with the Metropolitan Area Planning Council, we have hired a transportation expert to work with this plan to provide some way or hope to provide some way of getting the people out to the islands.

MR. QUARLES: Well, it is a superb program, and it exactly illustrates the reason for this whole concern on cleaning up the water pollution.

MR. BROWNELL: No question about it.

MR. McGLENNON: Arthur, when will you complete the acquisition? Do you know?

MR. BROWNELL; We are in the negotiation stage right now with the private owners. Depending upon how fast we can move or not move, whether we have to go to condemnation or not, I foresee this within the next year.

MR. McGLENNON: Do you have the right of eminent domain?

MR. BROWNELL: Yes, we do.

MR. STEIN: Do you intend that all of the islands, all 26, be publicly owned?

MR. BROWNELL: Yes.

MR. STEIN: Do you intend the maximum amount of recreation usage?

MR. BROWNELL: Not on all of the islands. There are some islands -- and particularly George's Island right now -- which are owned and managed by the Metropolitan District Commission for recreational purposes. We see that possibly some of the other islands in the harbor could be used as such as primitive camping areas but not really totally developed as we know a recreation area to be.

MR. STEIN: No, I'm talking about the waters.

MR. BROWNELL: The waters?

MR. STEIN: If all these islands are going to be publicly owned, what is your view on utilizing the waters in Boston Harbor for the maximum recreational use?

MR. BROWNELL: I think that we see some of the islands could be developed as swimming areas. There are some that have ideal beaches. Some of these would, we hope, be able to be used for swimming in the near future.

I will say that I think if you go out in Boston Harbor during the summer right now you will find many people using these facilities as such right now.

MR. STEIN: For swimming?

MR. BROWNELL: Yes.

MR. STEIN: How about the recreational use of shellfish harvesting on a sport basis rather than on a commercial basis?

MR. BROWNELL: I would say that I think Mr. Collins is going to cover the shellfish interests here.

MR. STEIN: No, I'm talking about recreational uses.

MR. BROWNELL: Even just recreational. I think we are opening up more shellfish areas now than we have in the past, and there is no question that the shellfish that we have not just in Boston Harbor but along our total coast-- The value is really not commercial. It is the recreational value.

MR. STEIN: I know on the west coast, for example, or maybe in some of the areas that I come from on the seashore, the clamming operation is a great recreational use and probably produces more in commercial impact than any commercial use could produce.

MR. BROWNELL: The one big commercial use that we do have as far as shellfish in Boston Harbor, of course, is the lobster industry.

MR. STEIN: Let me go into that. Shellfish under the Federal law means an oyster and a clam, and this far up you have run out of oysters. Mostly you have clams --

MR. BROWNELL: Well, --

MR. STEIN: -- that are eaten raw, alimentary canal and all. So the shellfish program -- and it's a word of art -- doesn't include lobsters or crabs.

But I think that clamming and just the recreational use of clamming would be a great thing here, don't you?

MR. BROWNELL: It certainly would. And it is.

There are areas along the shores of Boston Harbor that are used right now, yes, for commercial purposes, for digging of shellfish, but there again they are concentrated uses.

MR. STEIN: When we talk about recreational use of clamming and someone uses a clam gun or a spade to dig up a clam, we wouldn't ordinarily expect him to have the facilities of using depuration techniques to clean up that clam.

MR. BROWNELL: No, and he cannot --

MR. STEIN: In other words, the clam is going to have to be pretty good if he is going to be interested in the sport.

MR. BROWNELL: You cannot dig, or we hope that people are not, although our Division of Law Enforcement catches people that are digging, in moderately contaminated areas. The only ones that can dig are the persons with master digger's license.

MR. STEIN: The only ones you say can dig are those who have a master digger's license. The point is if we are going to get all these islands for recreational use and you are going to have recreational uses and people are going to go out and dig clams, you can't expect them to take them to clean waters and drop them in for a week or a month and let these clams purify themselves. But we are going to have to provide pure enough waters when these people take them home to their wives and children that they are going to feel reasonably safe.

MR. BROWNELL: I agree.

MR. STEIN: All right. And I think that is what Mr. Quarles was talking about this morning, because I see a connection with these.

As a matter of fact, probably in most of the areas when you get to the Boston Harbor area, if you are going to get all these areas for public use and the people are going to use the waters, they are going to go out whether you want them to or not. I know -- I'm in the enforcement business -- there are not enough cops to stop people from digging clams even if you wanted to.

MR. BROWNELL: That's right.

MR. STEIN: The idea is I think these people, once they dig a clam, are not going to consign it for a month to a depuration tank, but they are going to take it home and try to eat it.

I think if we open these areas we have an obligation to keep the waters clean enough so that when a man digs up a clam and takes it home to eat, he has a reasonable amount of protection for his wife and children.

MR. BROWNELL: Agreed.

MR. STEIN: Right. Thank you.

MR. BROWNELL: Thank you, Mr. Chairman.

MR. QUARLES: Thank you, Mr. Brownell.

MR. BROWNELL: Mr. Chairman, the next person I would like to call upon is Mr. John C. Collins, the Director of the Division of Environmental Health in the Massachusetts Department of Public Health.

STATEMENT OF

JOHN C. COLLINS

DIRECTOR, DIVISION OF ENVIRONMENTAL HEALTH

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

BOSTON, MASSACHUSETTS

MR. COLLINS: Thank you, Mr. Chairman, conferees, ladies and gentlemen. I would like to direct my statement to the factor of quality of the waters of Boston Harbor.

I have a fair amount of data here. Will this be made part of the record?

MR. STEIN: Where is your data?

MR. COLLINS: I have it here.

MR. STEIN: May we look at it?

MR. COLLINS: It is all bacterial data.

MR. STEIN: Let's look at the size. We will give it right back to you.

MR. QUARLES: Yes, we will receive this for inclusion in the record.

MR. COLLINS: Fine. I was wondering, in view of the statements that were made earlier to the press. I wanted to make sure this was a continuing part of the conference.

(Reporter's Note: The data referred to appears in the record at the conclusion of Mr. Collins' statement.)

MR. COLLINS: I am John C. Collins, Director of the Division of Environmental Health, the Massachusetts Department of Public Health.

I point out that I am delighted at this opportunity to speak here today. I point out that the department is vitally interested in the quality of water in Boston Harbor because of two programs in which it has a responsibility -- namely, the classification of shellfish areas and the oversight of the quality of bathing waters.

With regard to both shellfish harvesting and bathing in Boston Harbor, the department is of the opinion that one of the major sources of pollution has been the many drainage conduits which periodically discharge large volumes of raw sewage into the harbor. In 1965 it was necessary for the department to recommend the closing of certain beaches in the Dorchester Bay area.

From July to September 1970 the department in cooperation with other concerned agencies (Division of Water Pollution Control, the Metropolitan District Commission, the City of Boston Public Works Department, and the Boston Health and Hospital Division) conducted an in-depth survey and study of the problem. The study showed the effect that tides, rainfall, and combined sewer overflows have on the quality of water at the Dorchester Bay beaches.

In the published report -- that was the one I wished to enter into the record here, the report of the Massachusetts Department of Public Health to the Inter-agency Task Force on the Survey of the Dorchester Bay Beaches, 1970 -- the Department of Public Health specified that tidegates in combined sewer overflows contiguous to the Dorchester Bay bathing areas be installed, or rehabilitated, and maintained in order to maintain satisfactory bacterial quality of the water and be in agreement with Regulation 10, Article VII of the State Sanitary Code as adopted by the Department of Public Health.

Followup bacteriological examinations of the waters in Dorchester Bay during the summer of 1971 clearly show the marked improvement in water quality achieved by this program of tidegate construction, repair, and maintenance.

I point out -- it is not contained in here -- that our code says that one of the criteria is a guide of 1,000 coliform, that total coliform bacteria be used as a guide. This is one of the criteria for permissible bathing.

During this past summer the department alone -- I know the MDC and the city of Boston have -- has also collected samples. We collect these on a weekly basis. During the bathing season it has achieved this quality during this past summer. This is manifest by the fact that these beaches have remained open.

Additionally, the Department of Public Health classifies shellfish growing areas in accordance with the recommendations of the cooperative national shellfish sanitation program originally established by the U. S. Public Health Service in 1925. Under this program the department has adopted adequate laws and regulations for the sanitary control of the shellfish industry.

Within the periphery of Boston Harbor there are approximately 5,000 acres of shellfish growing area. Over 50 percent of this acreage has been classified as restricted and the remainder "closed" to shellfish harvesting. Shellfish harvested from restricted areas must be depurated at the Newburyport shellfish treatment plant of the Division of Marine Fisheries in the Department of Natural Resources.

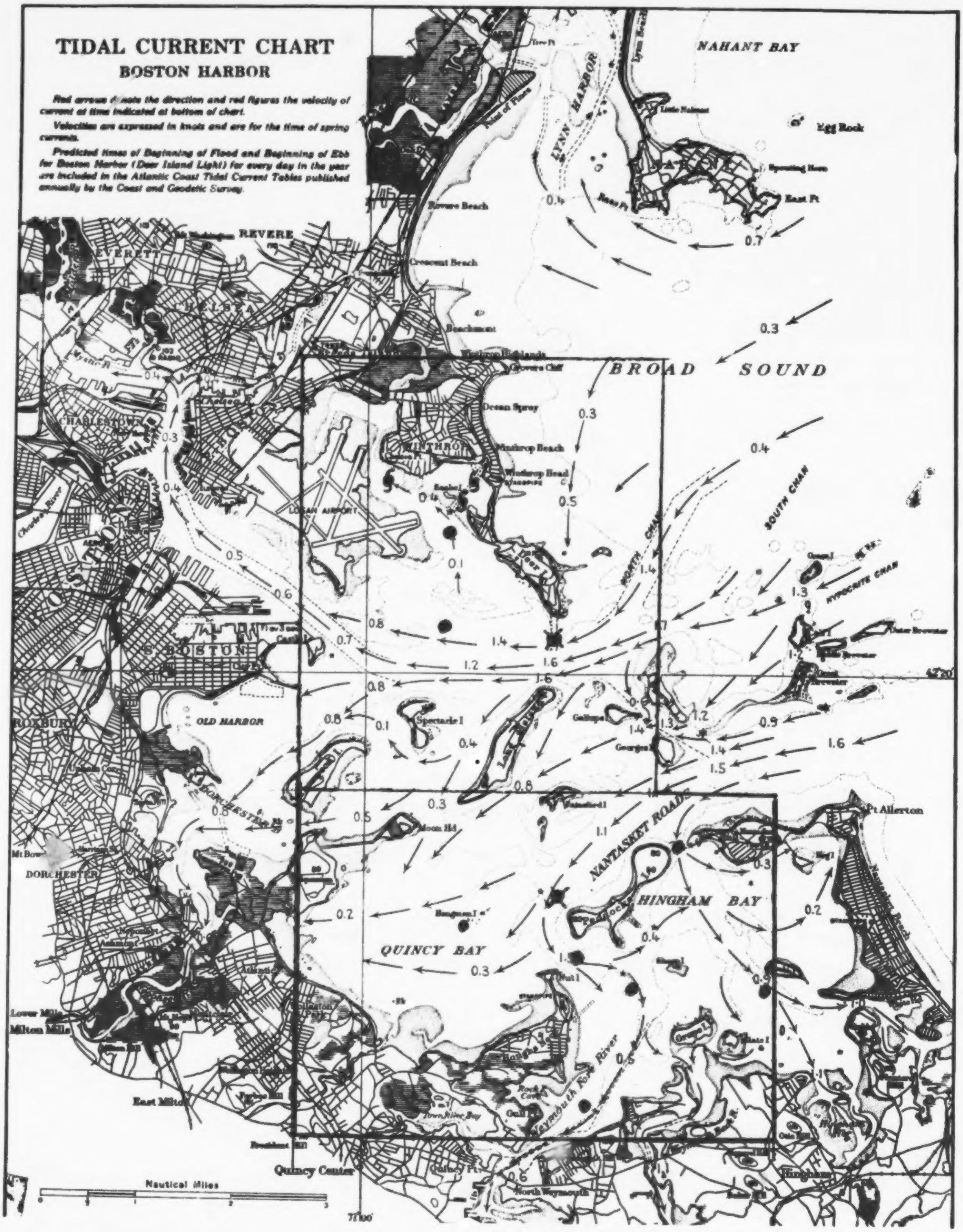
In April 1971 the Department of Public Health, based upon the improvement of the bacterial quality of the overlying water in Winthrop Bay, classified and opened an additional 130 acres classified as restricted which were formerly designated as "closed areas." These 130 acres were in the Winthrop Bay area.

I have further information on bacterial quality, and I brought some charts with me. I must apologize that we weren't able to put these on transparencies.

(Slide)

This is showing Boston Harbor here. This is a tidal flow chart.

(Copy of the slide follows.)



TIDAL CURRENT CHART
BOSTON HARBOR

Red arrows denote the direction and red figures the velocity of current at time indicated at bottom of chart.

Velocities are expressed in knots and are for the time of spring currents.

Predicted times of Beginning of Flood and Beginning of Ebb for Boston Harbor (Deer Island Light) for every day in the year are included in the Atlantic Coast Tidal Current Tables published annually by the Coast and Geodetic Survey.

NAHANT BAY
LYNN HARBOR
Egg Rock
East Pt
Revere Beach
Crescent Beach
REVERE
EVERETT
CHELSEA
CHARLESTOWN
Beachmont
Winthrop Highlands
BROAD SOUND
Grovers Cliff
Ocean Spray
WINTHROP
Winthrop Beach
Winthrop Head
LOGAN AIRPORT
SOUTH CHAN
HYPOCRITE CHAN
Outer Brewster
BOSTON
S. BOSTON
OLD HARBOR
ROXBURY
Spectacle I
Gallups I
Georges I
Moon Hd
DORCHESTER
NANTASKET ROADS
HINGHAM BAY
QUINCY BAY
Pt Allerton
Weymouth Fore River
Quincy Center
North Weymouth
Hingham
Milton Mills
Lower Mills
East Milton
Nautical Miles
0
1
2
3
71°00'
42°20'
0.7
0.3
0.4
0.3
0.5
0.1
1.4
1.3
0.4
0.5
0.6
0.8
0.7
1.4
1.6
1.2
0.8
1.6
1.2
0.9
0.8
0.1
0.4
1.4
1.3
1.4
1.5
1.6
0.8
0.3
0.5
0.8
1.1
0.3
0.2
0.4
0.2
0.3
0.6
0.6

In this upper rectangle -- I will have a little more detailed presentation later -- these red lines show the tidal flows.

Right here this particular station (indicating) is the Deer Island outfall. Running along the tidal flow is another sampling point. Up in here (indicating) is another sampling point leading into major shellfish producing areas.

Here are two areas I mentioned previously as having been opened in Winthrop Bay area.

And here is a further sampling station.

Off to the side here are the inner harbor beaches, L Street, Pleasure Bay, Carson Beach, Malibu, and Tenean. These are the areas. This data is contained in the study report.

As I said, we have further data showing the quality of this water as acceptable for bathing. These are the bathing beach areas.

In the lower quadrant here -- there will be a further detail later -- it is based around the Nut Island outfall. This cross-circle here is the actual Nut Island outfall.

Here is another point at the Hull gut.

Here is another one over in this area here (indicating).

Here are further sampling points leading into the Fore River area.

Here's one we call the West Gut between Peddock's and Nut Island.

And here's a further one out here at Hangman's Island.

In other words, we have six sampling stations here and some seven in this area (indicating).

What I am about to show you will be a representation of some 350 pieces of data, 125 of which were collected this last summer.

Next chart, please.

(Slide)

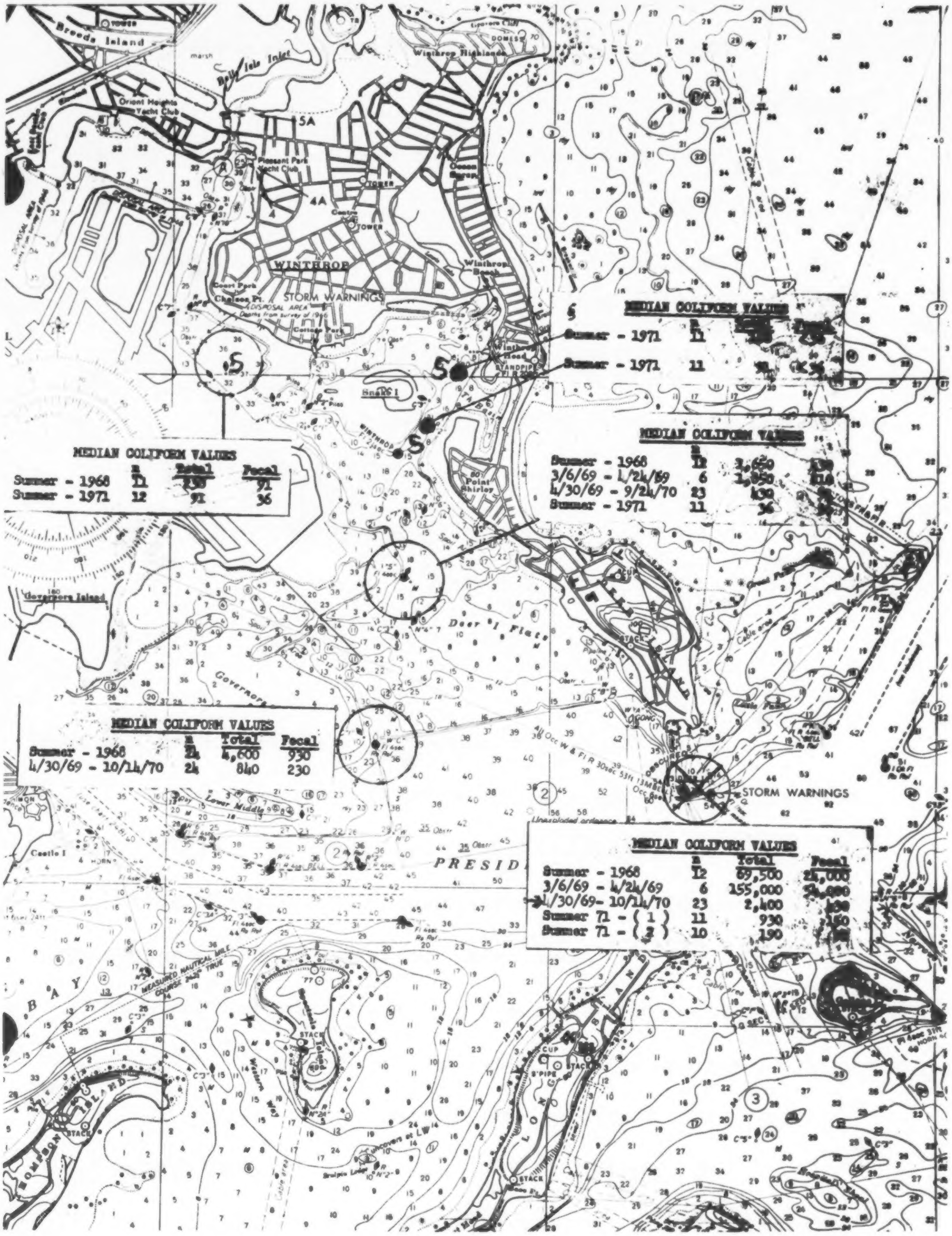
MR. QUARLES: I wonder if I could ask will there be a way to include this material in the record?

MR. COLLINS: Yes. We can do this up for the record. Appended to my statement -- I distributed copies earlier -- there is a limited presentation of some of the data. We can give you further data, but we didn't have time to pull this together.

MR. QUARLES: Thank you.

MR. COLLINS: This is looking at the upper quadrant, the upper rectangle of Boston Harbor.

(Copy of the slide follows.)


Breeds Island
Belle Isle Inlet
Orient Heights Yacht Club
Pleasant Park Yacht Club
Winthrop Highlands
5A
4
4A
WINTHROP
TOWER
Ocean Spray
Winthrop Beach
Court Park
Chelsea Pt.
STORM WARNINGS
DISPOSAL AREA
Winthrop Head
STANDPIPE
Snake I
S
WINTHROP
Point Shirley
Governors Island
Deer I Flats
Governors
Lower Middle
Castle I
PRESID
Unexploded ordnance
STORM WARNINGS
BAY
MEASURED NAUTICAL MILE
STACK
Western Way
S'PIPE
CUP
STACK
2
3

MEDIAN COLIFORM VALUES

	n	Total	Fecal
Summer - 1971	11	[illegible]	[illegible]
Summer - 1971	11	[illegible]	[illegible]

MEDIAN COLIFORM VALUES

	n	Total	Fecal
Summer - 1968	11	230	91
Summer - 1971	12	91	36

MEDIAN COLIFORM VALUES

	n	Total	Fecal
Summer - 1968	12	3,620	[illegible]
3/6/69 - 4/24/69	6	1,850	[illegible]
4/30/69 - 9/24/70	23	430	[illegible]
Summer - 1971	11	36	[illegible]

MEDIAN COLIFORM VALUES

	n	Total	Fecal
Summer - 1968	24	4,600	930
4/30/69 - 10/14/70	24	840	230

MEDIAN COLIFORM VALUES

	n	Total	Fecal
Summer - 1968	12	69,500	24,000
3/6/69 - 4/24/69	6	155,000	54,000
4/30/69- 10/14/70	23	2,400	430
Summer 71 - (1)	11	930	150
Summer 71 - (2)	10	190	[illegible]

This point here (indicating) is the Nut Island outfall. There are two outfalls here.

Just briefly, this wide circle represents about 500 yards. This is a pinpoint. Whenever you see a smaller circle there is actually a definite marker or buoy there.

We make one suggestion in collecting any data. One of the difficult facts we had to face was to correlate our sampling within a point so that is why we have a larger circle representing 500 yards. We have much more data, but we wanted to keep within a relatively significant distance.

But beginning here with the Deer Island outfall we have median coliform values. This is an expression as required in Massachusetts water standards.

You notice here for the summer of 1968 there are 12 samples collected right here. We are talking about samples collected right in the boil. We had a median value of total coliform of 69,500.

I also have fecal coliform here, but I think it is more relevant to speak in terms of total coliform.

In the period of March 1969 through April 1969, 6 samples, we had a median value of 155,000 total coliform.

Beginning April 30, 1969 -- which is the time the department recommended and the Division of Water Pollution recommended to the MDC that they go to a continuation program of chlorination of the plants -- it showed a marked and phenomenal decrease in the bacterial levels. So from the period of May 1969 through October 1969 the total of 23 samples showed the median value dropped to 2,400. We are talking median values previously of 70,000 and 155,000. It dropped to 2,400.

In the summer of 1971 it reflected a total of 21 samples here, and we collected at two boils or two outfalls. At one, with 11 samples, the median value had dropped to 930. At the other one, 10 samples, the median value had dropped to 190 coliforms per 100 ml.

It shows a fantastic drop in coliform concentrations as a result of chlorination. The specific point is this was collected right in the boil.

MR. QUARLES: Excuse me. I didn't clearly hear. You say without the chlorination?

MR. COLLINS: With chlorination.

MR. QUARLES: This drop occurred as a result of the --

MR. COLLINS: Continuation chlorination.

MR. QUARLES: -- adoption of the chlorination practices?

MR. COLLINS: Continuation chlorination.

MR. QUARLES: Right.

MR. COLLINS: Now, if we take this midpoint sampling station, we had in the summer of 1968 some 24 samples. The median coliform value, total coliform, was 4,600.

Beginning then with the continuous chlorination, and taking a period of March 1969 through October 1970, 24 samples, that value had dropped to 840 -- in other words, from 4,600 to 840.

Now we move up in this tidal current in the area we're particularly concerned with, and midway between here and these shellfish areas (indicating) in the summer of 1968, some 12 samples collected, we had a median value of 1,650. In April 1969, 6 samples, it was 1,850. Very close correspondence.

We come to the end of March, the beginning of continuous chlorination, 23 samples collected from March 1969 through September 1970, and it dropped to 430.

In the summer of 1971, 11 samples, it has dropped to 36.

Now, these are the shellfish areas, the 130 acres, that we opened. We opened those based on previous information but in other sampling locations.

Our summer samplings here following the opening show that in the summer of 1971, with this upper sampling station, 11 samples, we had a median value of 150 coliform. In this lower station, 11 samples, we had a value of 91 coliform.

Now, there is a direct correspondence with the classifications A and B based on really the overlying waters. With the value of 70 coliform -- up to 70 coliform per 100 ml -- the area is considered as an open area free to any digging. Between 70 and 700 it is a restricted area requiring depuration. So you can see why these areas were becoming rather marginal with an open area.

Further up here is another shellfish area that has been continuously opened. In 1968 the median value of 11 samples was 230. In the summer of 1971, 12 samples, the median value has gone down to 91.

Now, these tabular values are attached to the statement but they don't represent all the data.

(Slide)

You can see very clearly this is a random array, a random selection of samplings. These begin in March of 1968 and continue through March 1969.

(Copy of the slide follows.)

COLIFORM CONCENTRATIONS (MPN)*
DEER ISLAND OUTFALL

Date	Total	Fecal	Date	Total	Fecal
4/30/68	24,000	24,000	4/30/69	230	230
4/30/68	24,000	9,300	5/7/69	2,400	91
5/1/68	46,000	24,000	5/15/69	36	36
5/1/68	93,000	46,000	5/29/69	930	430
5/7/68	240,000	43,000	6/12/69	460,000	24,000
5/7/68	240,000	93,000	6/24/69	11,000	2,100
5/8/68	240,000	240,000	7/1/69	240	240
5/8/68	24,000	24,000	7/7/69	2,400	2,400
5/15/68	110,000	24,000	9/23/70	230	230
5/15/68	240,000	110,000	9/29/70	24,000	930
5/22/68	1,500	390	9/30/70	2,400	430
3/6/69	11,000	2,400	10/20/70	4,600	2,400
3/26/69	240,000	240,000	6/21/71	36	36
4/17/69	46,000	46,000	6/28/71	750	430
4/3/69	240,000	240,000	7/13/71	1,500	150
4/9/69	150,000	24,000	7/19/71	36	36
4/24/69	160,000	54,000	8/2/71	2,400	2,400

(*) All available data not presented in this Table.
This Table compares the coliform concentrations existing prior (columns 1 - 3) and subsequent (columns 4 - 6) to continuous chlorination practice.

John C. Collins

In column 2 are the total coliforms as taken. You can go down this array here. This is prior to continuation chlorination. The values are 24,000, 24,000, 46,000, 93,000, 240,000, 240,000, 240,000, 24,000, 110,000, 240,000, 1,500, 11,000, 240,000, 46,000, 240,000, 150,000, and 160,000.

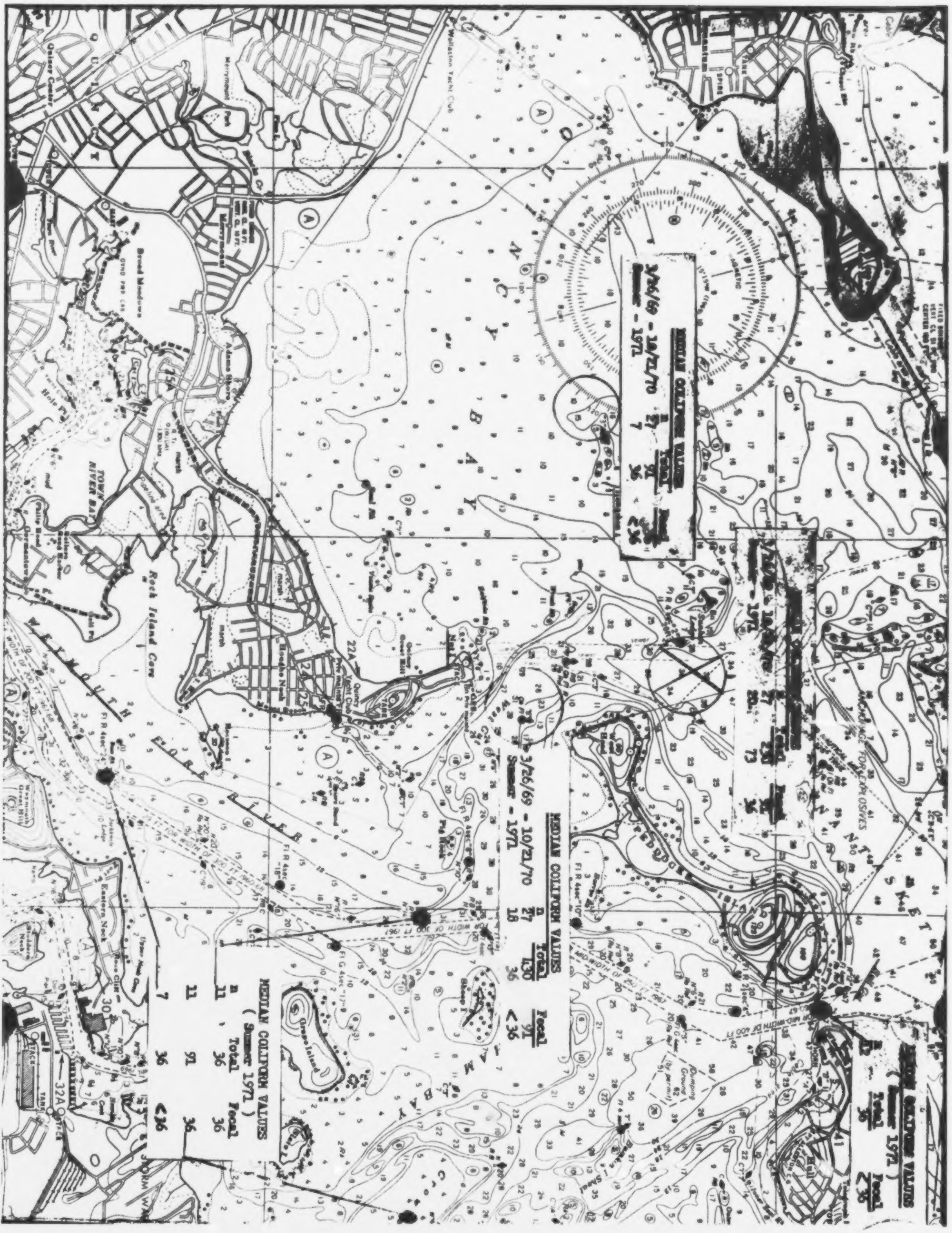
Still with the same random selection beginning the end of April 1969, the start of continuation chlorination, through August of 1971, you note the dramatic decrease in total coliform -- 230, 2,400, 36, 930, 460,000, 11,000, 240, 2,400, 230, 24,000, 2,400, 4,600, 36, 750, 1,500, 36, and 2,400.

So you can see just in the random presentation a dramatic decrease here.

(Slide)

This is the lower rectangle I showed you earlier.

(Copy of the slide follows.)


MEDIAN COLIFORM VALUES
(Summer 1971)
n Total Fecal
12 36 <36
MEDIAN COLIFORM VALUES
3/26/69 - 10/21/70 27 230 91
Summer - 1971 20 73 36
MEDIAN COLIFORM VALUES
n Total Fecal
3/26/69 - 10/21/70 27 91 36
Summer - 1971 7 36 <36
MEDIAN COLIFORM VALUES
n Total Fecal
3/26/69 - 10/21/70 27 130 91
Summer - 1971 18 36 <36
MEDIAN COLIFORM VALUES
(Summer 1971)
n Total Fecal
11 36 36
11 91 36
7 36 <36
QUINCY BAY
QUINCY
Quincy Center
Wollaston Yacht Club
Merrymount Park
Adams Shore
Broad Meadows
TOWN RIVER BAY
Rock Island Cove
Quincy Yacht Club
Quincy Great Hill
Houghs Neck
WEYMOUTH FORE RIVER
Eastern Neck
Weymouth Great Hill
Grape Island
Sheep I
HINGHAM BAY
NANTASKET
ANCHORAGE FOR EXPLOSIVES
Dumping Ground (by permit)
Pig Rock
Peddocks Island
Hull
Squantum
22A
24
25
25A
30
32A

This cross-hatched area is the Nut Island outfall. Now, Nut Island we have never viewed as anywhere near the problem Deer Island was. But starting with the continuation chlorination our median coliform values through 1969 and 1970 of 27 samples were 230.

In the summer of 1971, with 20 samples, it was down to 73.

Again, these samples were collected in the boil or the outfall.

In further samples now, taking these other areas after the chlorination began, the median value of 27 samples was 430, and in 1971 the median value of 18 samples was 36.

Here we have a total of 12 samples -- this is in the Hull Gut here -- of a median value of 36.

You come down here showing Crow Point right off of Sheep Island here and lower into the Fore River yards with a median value of 36 out of 11 samples, a median value of 91 in 11 samples, and a median value of 36 from 7 samples.

Out here on Hangman's Island, median value of 91 for 27 samples and median value of 36 from 7 samples.

Up there, as I said, we are talking about an array of some 350 samples, 125 taken this last summer.

In general, it can be concluded based on our assessment of the data which we have collected that the bacterial quality of the water in Boston Harbor is showing a noticeable improvement, particularly since the MDC has adopted the policy of continuation chlorination of all effluents from Deer Island.

In conclusion, the Department of Public Health would like to emphasize several points:

1. Year-round chlorination of effluents at Deer Island and Nut Island, construction and maintenance of tidegates, and enforcement of existing antipollution laws are resulting in a significant improvement in the quality of water in Boston Harbor as it is related to bathing and shellfish harvesting.

2. State and local agencies such as the Department of Public Health and-- And for those of you who have the statement, a mere slip of the typewriter changed the "Department" of Natural Resources to the "Division" of Natural Resources. Commissioner, I hope you don't mind. (Laughter) But, as I said, State and local agencies such as the Department of Public Health, the Department of Natural Resources, the Metropolitan District Commission, the City of Boston Department of Public Works, and Boston Health and Hospital Division have shown they can

effectively work together to solve a problem. An enlargement and continuation of such cooperation is obviously desirable.

3. Until such time as the Federal Government demonstrates its seriousness by actually appropriating significant amounts of money to initiate the expensive long-range solutions, the local agencies such as the MDC and the various cities and towns around Boston Harbor can make their greatest contribution to improving the quality of water in the harbor by appropriating their limited funds to interim solutions such as chlorination, tidegate maintenance, stormwater control, and limited sewer construction to keep raw sewage out of the harbor.

Thank you.

(The additional data submitted by Mr. Collins, entitled "Report of the Massachusetts Department of Public Health to the Interagency Task Force on the Survey of the Dorchester Bay Beaches, 1970," follows.)

Pleasure Bay Beach

"L" Street Beach

Carson Beach

Malibu Beach

Tenean Beach

—Part One—

The Commonwealth of Massachusetts
Department of Public Health
600 Washington Street Room 320
Boston 02111

DIVISION OF
ENVIRONMENTAL HEALTH
TEL: (617) 727-2690

Commissioner of Massachusetts Department of Public Health
Commissioner of Metropolitan District Commission
Commissioner of Massachusetts Department of Natural Resources
Director of Division of Water Pollution Control
Mayor of the City of Boston
Commissioner of Public Works, City of Boston
Commissioner of Health and Hospitals, City of Boston

Appended herewith is the report of the Department of Public Health to the Inter-Agency Task Force regarding the survey of the Dorchester Bay Beaches. This report covers a period of study from July 1970 to September 1970.

This report includes an in-depth study of the pollutional effects of the Sewerage System contiguous to the Dorchester Bay Beaches, as well as the effect of tidal phases, rainfall, and other meteorological conditions on the quality of bathing water at these beaches.

An evaluation of the pollution conditions existing at these beaches and recommendations of the Department of Public Health are also included in this report.

We wish to express our sincere appreciation to the members of the Inter-Agency Task Force as well as all personnel involved in this cooperative effort.

Very truly yours,

John C. Collins
Director
Division of Environmental Health

Approved: Alfred L. Frechette
Alfred L. Frechette M.D.
Commissioner

TABLE OF CONTENTS

	Page
Introduction	ii
Bathing Water Guidelines	vi
Summary of Findings and Recommendations	ix
List of Figures	xi
List of Tables	xi
List of Photographs	xi
Section I - Bathing Water Quality at Pleasure Bay	1
Section II - Bathing Water Quality at "L" Street Beach	10
Section III - Bathing Water Quality at Carson Beach	18
Section IV - Bathing Water Quality at Malibu Beach	27
Section V - Bathing Water Quality at Tenean Beach	37
Summary	63

Introduction

The pollution of the Dorchester Bay area of Boston Harbor is intrinsically bound to the malfunctions of the drainage system of the City of Boston, and in particular, the faulty operation of the Dorchester Interceptor and the South Branch of the South Boston Interceptor. These sections of the Boston sewerage system were constructed during 1884 and 1887 and no major overhaul or routine preventive maintenance programs have been made to keep them in satisfactory operable condition. The inadequacies and disrepair of the appurtenances of these drainage conduits have been itemized and discussed in previous engineering reports. (Report on Improvements to the Boston Main Drainage System, 1967, Volume 1 and 2, Camp, Dresser and McKee) The entrance of sea water into the system and the inability of the system to handle rainfall-runoff from the land area contiguous to Dorchester Bay are the two major conditions that foster pollution of this water body. Sea water enters the system through malfunctioning or missing tide gates during incoming tide and resultant sea water-sewage mixtures are discharged in close proximity to bathing and shellfish areas in Dorchester Bay on outgoing tides. Rainfall-runoff collected by the system causes intermittent surcharging of the interceptors with the release of sewage laden wastewater to the marine environment. On occasions, even in dry weather, the plugging of sumps in this waste-carriage system can force sewage to be discharged to the Bay area.

There are five beaches in the Dorchester Bay area, namely Pleasure Bay, Carson, L Street, Malibu, and Tenean. The pollution problems associated with Tenean Beach have been studied most extensively during the past few years by the field and laboratory staffs of the Division of Environmental Health, Massachusetts Department of Public Health. As a result of these investigations, the Department recommended that Tenean Beach be closed to bathing in a letter to the Commissioner of the Metropolitan District Commission on July 3, 1969. This closure was based upon 1) a sanitary survey that uncovered numerous pollution sources periodically discharging sewage to the bathing area, and 2) excessively high bacterial concentration in the bathing water. During the summer of 1969, numerous meetings were held by officials of the City of Boston, the Metropolitan District Commission, and the Division of Environmental Health to discuss the causes of pollution at Tenean Beach and the possible abatement measures that could be employed to eliminate these pollution sources.

On July 1, 1970 a multi-agency meeting was convened of all parties having an interest in the operation of the bathing water quality at all beaches in the Dorchester Bay area. This conference was chaired by Mr. John C. Collins, Director of the Division of Environmental Health and the following officials were in attendance: Mr. John W. Sears, Commissioner of the Metropolitan District Commission; Mr. Arthur W. Brownell, Commissioner of the Massachusetts Department of Natural Resources; Mr. Joseph F. Cassazza, Commissioner of Public Works, City of Boston; Mr. Thomas C. McMahon, Director of the Division of Water Pollution Control, and ten members from the professional staffs of these agencies and the Boston Department of Health and Hospitals.

As a result of this conference, an action orientated task force was formed to investigate the pollution problem in the Dorchester Bay section of Boston Harbor. Members of the task force included: Mr. George J. Coogan, Director of the Bureau of Water Supply and Water Quality, Division of Environmental Health; Mr. Allison Hayes, Director of the Sewerage Division and Chief Sewerage Engineer, Metropolitan District Commission; Mr. James F. Carter, Acting Division Engineer, Boston Public Works Department; and Mr. Alfred J. Ferullo, Bioengineer, Division of Water Pollution Control, Department of Natural Resources. The goals and objectives of this task force were delineated as follows:

1. To locate the sources of pollution entering Dorchester Bay and determine what effects their discharges impose on the bacterial quality of the bathing water at the five beaches in the Bay Area, namely, Pleasure Bay, Carson, L Street, Malibu, and Tenean.
2. To study the effect of tidal phases, rainfall and other meteorological conditions, either singly or combined, on the quality of water at these Dorchester Bay beaches, and
3. To assess the effects that malfunctioning tide gates and regulators appurtenant to the South Boston sewage system have on the pollution problem in the Dorchester Bay area.

Part I

The investigative program for each of the five beaches in Dorchester Bay is designed to accomplish the above mentioned goals and objectives, and was divided into three separate phases as follows:

Phase I - Sanitary Survey

Task force personnel aided by previous reports on the Boston Sewerage System and by an on-site walking inspection of the shore line determined the active pollution source influencing the water quality of the five beaches being studied. These surveys were documented by photographs, where possible, and the degree of sewage pollution present in the discharges from a pollution source was determined by bacteriological examinations. All storm drains were inspected to determine the working condition of the tide gates, regulators and sumps appurtenant to these conduits.

Phase II - Collection and Analysis of Grab Bacteriological Samples

A bacteriological sampling program was established for each beach in the Dorchester Bay area on the basis of a sanitary survey and the length of the beach. Grab samples from designated locations were collected twice weekly during the bathing season by M.D.C. personnel and analyzed for their total and fecal coliform concentration at the Lawrence Experiment Station, Division of Environmental Health. Upon completion of this analytical study, the data was assembled and statistically analyzed to determine the levels of pollution existing at the selected sampling points and whether the bacteriological quality of the water at the beach stations was in agreement with the Department of Public Health's adopted guidelines for bathing water.

Phase III - Effect of Tide on Water Quality

During this phase of the investigation, each beach in the Dorchester Bay area was subjected to a concentrated sampling program to determine the variation in bacterial quality that occurs with various tidal phases. The personnel of the task force collected samples, at approximately hourly intervals, from the selected stations at each beach during a tidal cycle. These samples were analyzed for their coliform concentration at a temporary field laboratory installed at the M.D.C. Headworks on Columbia Boulevard by personnel of the Lawrence Experiment Station using the MF procedure developed by this laboratory. The chloride concentration of selected samples was also determined to provide a basis for estimating the percentage of sea water and fresh water at a sampling station during a tidal phase.

Guidelines for Bathing Water Quality

The Massachusetts Department of Public Health has established and adopted a set of guidelines for judging bathing water quality. These guidelines are contained in Article VII, Regulation 10 of the State Sanitary Code entitled "Minimum Standards for Bathing Beaches." This regulation provides that bathing beaches shall be disapproved for bathing and swimming purposes when:

a) The results of a sanitary survey by the Massachusetts Department of Public Health discloses sewage or other hazardous substance is or may be discharged into the bathing beach waters to a degree considered by the Massachusetts Department of Public Health to be of public health significance, or

b) Epidemiological evidence by the Massachusetts Department of Public Health discloses the prevalence of an infectious disease which is considered as related to the use of the bathing beach waters, or

c) The bacteriological quality of the bathing beach waters indicates that sewage or other hazardous substance is being discharged into the bathing or swimming areas; or that high bathing density has created a condition which is or may be dangerous to the public health. A coliform count of over 1000 per 100 ml shall be considered as a guide requiring additional investigation, survey or special analyses as may be necessary.

Bacteriological Guidelines for Bathing Waters

Most regulating and enforcement agencies have adopted the coliform group as the prime bacterial indicator for classifying bathing waters. The wide acceptance of the coliform group, for this purpose, stems from the established association of this microbial group with the pathogenic microorganisms potentially present in sewage, the enormous numbers of coliform in the wastes of warm-blooded animals, and the relatively simple testing procedure required to establish their presence and concentration.

A coliform standard of 1000 per 100 ml is used by most public health agencies as a basis for judging bathing water quality. In Article VII, Regulation 10 of the State Sanitary Code, a coliform count of 1000 per 100 ml is established to indicate bathing water of questionable quality. This value is used only as a guide. As used in this Code, the 1000/100 ml standard is a single sample standard; bathing waters exhibiting this coliform level should be further surveyed and analysed to determine whether a pollution source actually exists and the variability in coliform levels occurring in subsequent samplings.

Within the last few years, several investigators have suggested that fecal coliform bacteria should be used as the indicator for evaluating the microbiological suitability of recreational waters. They emphasize that the fecal coliform level in a sample is more directly related to the degree of fecal contamination than the total coliform level and thus has greater sanitary significance. These researchers have recommended a limit of 200 fecal coliforms per 100 ml for primary contact recreational water use.

Single sample standards fail to consider the extreme variations in bacterial concentrations that may be due to environmental conditions, unrelated to any public health menace, and also fail to take into account the inherently poor precision and accuracy that is embodied in the MPN method for measuring total and fecal coliform concentrations. It is quite conceivable that judgments based on a single sample standard may erroneously classify a recreational water as "safe" or "unsafe."

In the study of the Dorchester Bay beaches, many variables were involved.

The tide, rainfall, runoff, the Neponset River and even the wind all exert some influence on the results and the samples themselves were necessarily grab samples obtained from selected sampling stations. With the injection of so many variable factors the use of the median total and fecal coliform values, calculated from an array of sample analyses, was judged to be a more reasonable and scientific guideline for estimating the bacterial quality of bathing water.

Based on this approach, the bacteriological results of the grab samples collected in this survey were used to indicate the possible presence of a condition at the Dorchester Bay Beaches which had public health significance.

Summary of Findings and Recommendations

The Department of Public Health found that the five Dorchester Bay bathing beaches can be classified into three categories.

Category I

Pleasure Bay is the only bathing area which falls into this category. No active on-shore pollution sources were found during the sanitary survey and satisfactory coliform levels were found at all beach stations during the 1970 bathing season.

The Department recommends that a biweekly bacteriological sampling program be established by the Metropolitan District Commission at this recreational area during the bathing season to monitor the quality of the bathing water.

Category II

Malibu, Carson, and "L" Street beaches fall into this category. On the basis of the bacteriological data accumulated by the Task Force during the 1970 bathing season, the bacteriological quality of water at these beaches is judged to be satisfactory. This judgment is based on an evaluation of both the total and fecal coliform median values derived from the results of the grab samples collected during the 1970 bathing season. It is recognized that certain stations at these beaches exhibited a fairly high percentage of samples containing fecal coliform counts in excess of the single sample guideline. A further examination of the raw data showed that a large number of the samples were only slightly higher than the guideline value.

The sanitary survey of these beaches, however, uncovered numerous on-shore sources that contribute active and continuing sewage pollution to the beaches. Specific conditions such as missing or inoperative tide gates and regulators and plugged sumps are described in the body of the report. The existence of active sources of pollution into bathing areas is in violation x

of the Sanitary Code.

Specific recommendations, including a sampling program, are presented in the report for each beach. Until these recommendations are acted upon, the Department cannot approve the use of these beaches for bathing.

Category III

Tenean Beach falls into this category.

The results of the bacteriological analyses indicate that the water at Tenean possesses higher levels of pollution than any of the other beaches studied.

Although almost all median total and fecal coliform values fall within the guidelines, the degree of pollution indicated by the numbers of samples exhibiting total coliform concentrations in excess of 10,000/100 ml and fecal coliform concentrations in excess of 1000 per 100 ml were judged to be significant and meaningful in assessing the public health hazards associated with this bathing area.

The sanitary survey of the Tenean Beach area disclosed several sources of pollution such as the Garvey Street Playground and malfunctioning tide gates and regulators. The Department makes specific recommendations about these sources of pollution in the report. The sewerage and drainage pattern in the area tributary to Tenean Beach is complex and there is no guarantee that even after all of the recommended work is undertaken there will be no pollution from other sources.

Consequently, in the case of Tenean Beach the Department recommends that even after the recommendations are complied with the present system whereby bathing at this beach is restricted by tidal cycle and rainfall be continued and that the M.D.C. conduct a concentrated bacterial testing program to assure that all sources which contribute pollution to this beach have been located and corrected.

List of Figures

FIGURE 1	Pleasure Bay Grab and Tidal Cycle Sample Stations
FIGURE 2	"L" Street Grab and Tidal Cycle Sample Stations
FIGURE 3	Carson Beach Grab Sample Stations
FIGURE 4	Carson Beach Tidal Cycle Sample Stations
FIGURE 5	Malibu Beach Grab Sample Stations
FIGURE 6	Malibu Beach Tidal Cycle Sample Stations
FIGURE 7	Tenean Beach Grab Sample Stations
FIGURE 8	Tenean Beach and Neponset River Tidal Cycle Stations
FIGURE 9	Tenean Beach Chloride Concentrations

List of Photographs

PHOTOGRAPH 1	Pleasure Bay Beach
PHOTOGRAPH 2	Pleasure Bay Causeway with Sluice Gate
PHOTOGRAPH 3	"L" Street Beach
PHOTOGRAPH 4	Carson Beach
PHOTOGRAPH 5	Malibu Beach
PHOTOGRAPH 6	Malibu Beach - Pollution Source #100
PHOTOGRAPH 7	Tenean Bay - Pollution Source #103
PHOTOGRAPH 8	Tenean Beach - Pollution Source #105

List of Tables

TABLE 1	Bacteriological Results of Grab Samples from Pleasure Bay
TABLE 2	Pleasure Bay Beach Survey - Bacteriological Examination
TABLE 3	Bacteriological Results of Grab Samples from "L" Street Beach
TABLE 4	"L" Street Beach Survey - Bacteriological Examination
TABLE 5	Bacteriological Results of Grab Samples from Carson Beach

TABLE 6 Carson Beach Survey - Bacteriological Examination

TABLE 7 Bacteriological Results of Grab Samples from Malibu Beach

TABLE 8 Malibu Beach Survey - Bacteriological Examination

TABLE 9 Bacterial Pollution from On-shore Sources to Tenean Beach and Tenean Bay Area

TABLE 10 Bacteriological Results and Classification of Grab Samples from Tenean Beach

TABLE 11 Classification of Samples Collected at Tenean Beach

TABLE 12 Tenean Beach and Neponset River Survey - Bacteriological Examination

TABLE 13 Median Coliform MPN Values Calculated from Grab Sample Data

TABLE 14 Percent of Samples that Exceeded Bacteriological Guidelines

Section I

Bathing Water Quality at Pleasure Bay

Location and Description - Pleasure Bay, in actuality a large land-locked lagoon, was created by the M.D.C. in 1958 at a cost of approximately one million dollars, by the construction of a causeway connecting Castle Island, Head Island and the mainland. It is bordered by Marine Park on the west, the William J. Day Boulevard on the north and Castle Island on the east. A map, showing the size, configuration, and the adjoining land around Pleasure Bay, is presented in Figure 1 and a stretch of the bathing beach is shown in photograph No. 1. The water level in this enclosed pool is regulated and maintained by a sluice gate and spillways built into the causeway (photograph No. 2). During the bathing season, Pleasure Bay is the most popular and consequently the most heavily used beach in Dorchester Bay.

Results of Task Force Studies

Phase I - Sanitary Survey

The sanitary surveys conducted by members of the Task Force during the summer months found no active sources of pollution along the beach, however, it is noted that the Reserve Channel, carrying combined sewer overflows empties in close proximity to the entrance to Pleasure Bay and thus may well influence the quality of the water in the lagoon. A study made in 1969, by the Division of Environmental Health of the Massachusetts Department of Public Health, indicated that the bacterial quality of the water on the ocean-side of the causeway would fail to meet the standards for a bathing area. It should also be noted that tidal changes foster relatively poor flushing of this section of Boston Harbor and thus delay the removal of any pollution deposited in this locality.

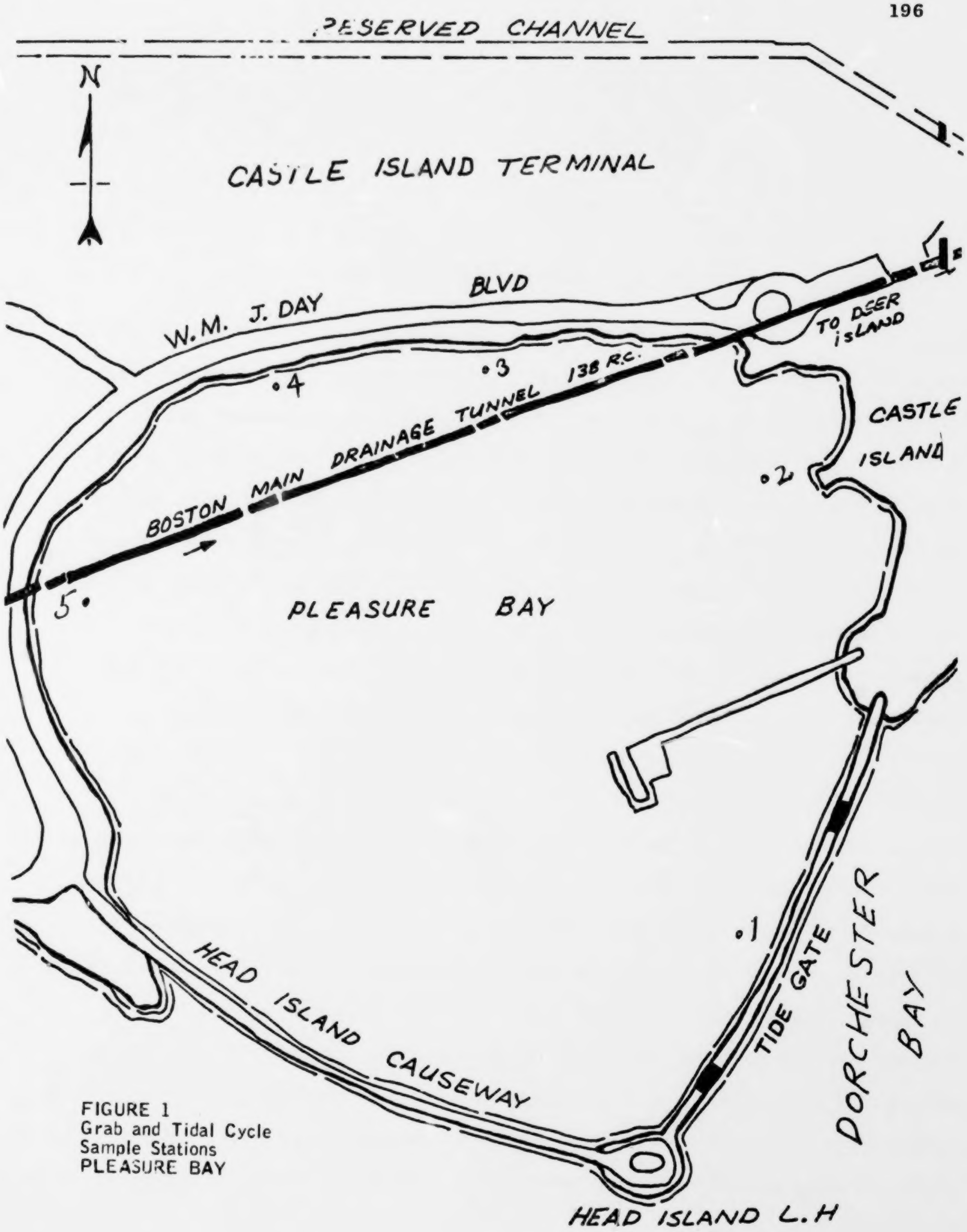
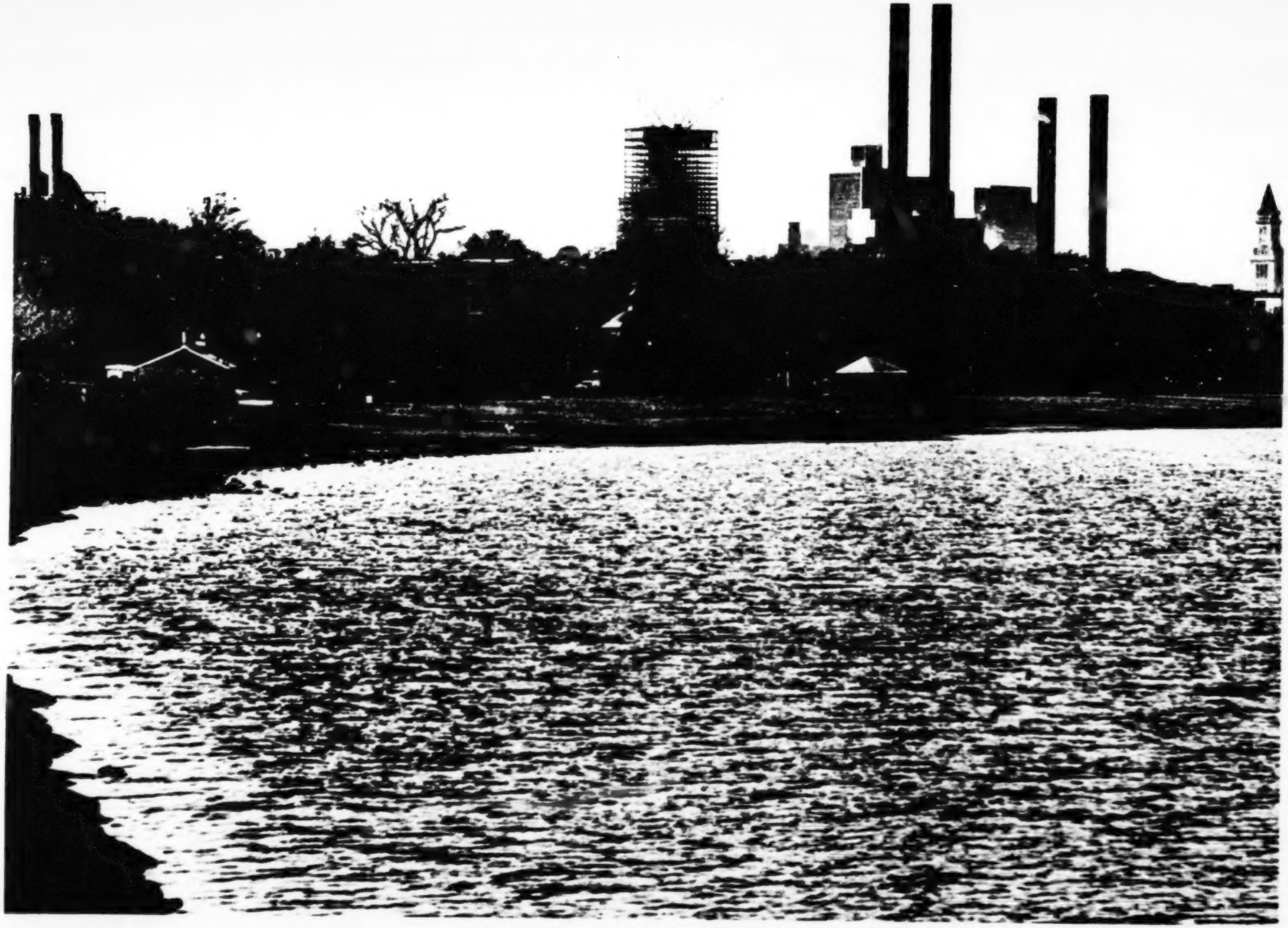
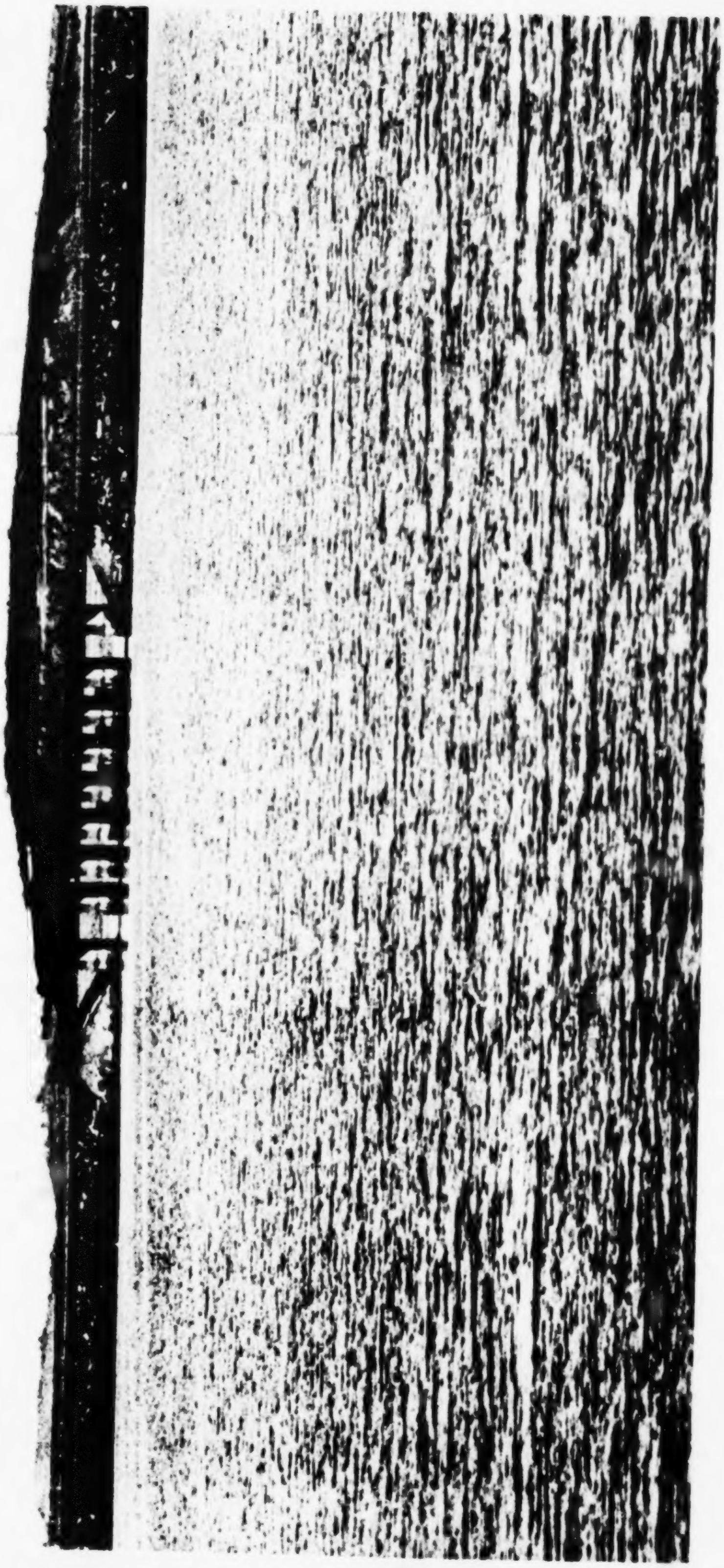

RESERVED CHANNEL
N
CASTLE ISLAND TERMINAL
W.M. J. DAY BLVD
TO DEER ISLAND
138 R.C.
BOSTON MAIN DRAINAGE TUNNEL
4
3
2
5
CASTLE ISLAND
PLEASURE BAY
1
TIDE GATE
DORCHESTER BAY
HEAD ISLAND CAUSEWAY
HEAD ISLAND L.H

FIGURE 1
Grab and Tidal Cycle
Sample Stations
PLEASURE BAY



Photograph No. 1

PLEASURE BAY BEACH - SEPT. 1970



Photograph No. 2

PLEASURE BAY CAUSEWAY WITH SLUICE GATE - SEPT. 1970

Phase II - Collection and Analyses of Grab Bacteriological Samples

Four sampling stations were selected to observe the bacterial quality of the bathing water in Pleasure Bay and one station was chosen to determine the pollution level of the ocean water entering the lagoon area through the sluice gate. The location of these sampling sites are identified on Figure 1. Grab samples from these stations were collected on a random time schedule during the summer months and examined for total and fecal coliform MPN concentrations. The bacterial densities found in these samples are tabulated in Table 1. The time of collection, the time of high tide and the rainfall occurring twenty-four and forty-eight hours prior to the collection time are also included in this Table. From the bacteriological data, the median total and fecal coliform MPN densities were calculated for each sampling station and are presented in Table 13. The number and percentages of samples from each station that exceeded the guidelines for total and fecal coliform concentration in bathing water have been determined and are listed in Table 14.

Discussion of Results - All the total and fecal coliform median values calculated from the grab sample results are well below the bathing water guidelines for these pollution parameters. The beach sampling stations show MPN ranges of from 36 to 91 for total coliform and from less than 36 to 64 for fecal coliform. Although the median total coliform MPN at Station 1 was observed to be slightly higher than the beach stations, namely 230, it is still well below the guideline of 1000/100 ml.

The data presented in Table 1 and 14 indicate that seven out of the seventeen grab samples (41.2%) collected at Station 1 exceeded both the total and fecal coliform guidelines of 1000/100 ml and 200/100 ml respectively. On further analysis of this data, with respect to times of collection and high tide, it is quite apparent that the majority of samples failing to meet the guidelines were collected on the incoming tide. Judging from the bacterial concentrations found at Stations 2 and 5, it would

Table 1

Bacteriological Results of Grab Samples from Pleasure Bay

Coliform MPN/100 ml

Date 1970	Coll. Time	High Tide	Rain Within 24 hrs	Rain Within 48 hrs	Station 1 Total	Station 1 Fecal	Station 2 Total	Station 2 Fecal	Station 3 Total	Station 3 Fecal	Station 4 Total	Station 4 Fecal	Station 5 Total	Station 5 Fecal
6/9	1035	324	-	0.07	36	<36	<36	<36	91	<36	<36	<36	-	-
6/10	1210	412	-	-	36	36	91	36	150	36	-	-	-	-
6/11	1145	500	-	-	<36	<36	230	230	<36	<36	36	<36	<36	<36
7/6	1225	1406	-	0.66	2400	930	<36	<36	36	<36	230	230	36	36
7/8	1545	1524	-	-	230	<36	36	<36	91	36	36	<36	36	36
7/13	920	654	0.22	0.23	36	<36	<36	<36	<36	<36	430	150	930	73
7/21	1410	1406	-	-	430	91	91	<36	91	91	430	430	<36	<36
7/23	1455	1548	-	-	2400	930	91	<36	<36	<36	91	91	73	<36
7/28	943	818	0.11	0.11	<36	<36	36	36	36	<36	<36	<36	<36	<36
7/30	943	1024	-	-	1500	430	<36	<36	91	91	36	36	<36	<36
8/11	1340	618	0.93	0.93	36	<36	91	<36	150	150	930	930	430	230
8/18	1007	1248	0.53	0.53	4600	930	91	36	430	36	91	36	230	91
8/20	1300	1430	0.45	0.45	4600	4600	91	36	930	430	930	430	91	91
8/25	1355	648	-	1.55	91	36	91	<36	36	<36	36	<36	36	36
8/27	1325	854	-	-	4600	430	91	91	150	<36	230	230	36	36
9/1	1430	1230	-	-	1500	430	91	36	91	36	91	<36	<36	<36
9/3	1400	1336	.04	.04	<36	<36	<36	<36	36	<36	230	230	-	-

appear that the influence of this periodic tidal pollution is minimized possibly by sedimentation, bacterial-die away, storage and dilution. The bacteriological data show that the total coliform guideline was not exceeded in any grab sample collected at the beach stations (2 to 5) and the fecal coliform guideline of 200/100 ml was exceeded only once at Stations 2, 3, and 5 and six times at Station 4, or approximately 4% of the beach samples analyzed. The relatively high number of samples from Station 4 that exceeded the fecal coliform guideline may indicate that short-circuiting occurs at high tide from the ocean's entrance (Station 1) directly across the lagoon to Station 4.

Phase III - Effect of Tidal Cycle on Water Quality

The variation in the bacterial quality of the water in Pleasure Bay, during a tidal cycle, was determined by the analysis of eleven sets of samples collected from five stations (Figure I) at approximately hourly intervals. The coliform concentrations of these samples were determined by the membrane filter procedure in a temporary field laboratory set-up at the MDC Headworks on Columbia Boulevard. The results of this study are presented in Table 2. This in-depth study confirmed many of the conclusions drawn from the results of the grab sample program. The bacterial quality of the water at the four beach stations showed extremely low to moderate coliform levels throughout the tidal cycle. Although the density of coliform organisms in the water at Station 1 increased at high tide, there was no evidence of short-circuiting between Station 1 and Station 4.

Summary of Findings

1. No active on-shore pollution sources to the beach area of Pleasure Bay were found during the sanitary survey.

2. The effect of the Reserve Channel, emptying in close proximity to the entrance to Pleasure Bay, appears to be most significant at high tide.

3. The analyses of the bacteriological results from the grab sample program and the tidal effect study indicate satisfactory coliform levels at all beach stations in Pleasure Bay.

Table 2

PLEASURE BAY BEACH SURVEY

Bacteriological Examination

M.F. Coliform/100 ml.

Sampling

Time: 753 - 1900

Date: July 22, 1970

Wind Direction - S.W.

High Tide - 1454

Low Tide - 842

					Run #							
Station	Time of Collection /	I 753	II 945	III 1048	IV 1150	V 1315	VI 1400	VII 1500	VIII 1600	IX 1702	X 1800	XI 1900
1		50	60	20	<10	230	1500	1800	30	70	60	10
2		190	80	300	430	110	290	60	140	310	110	100
3		50	190	<10	<10	<10	30	10	10	10	10	10
4		260	130	20	80	<10	20	10	<10	20	<10	<10
5		170	60	70	10	20	160	10	<10	<10	10	<10

4. The poor water quality entering the lagoon at high tide does not seem to have a marked effect on the quality of water at the beach stations.

Recommendation of Department of Public Health

The Task Force results indicate that the water in Pleasure Bay during the summer of 1970 met the bathing water quality standards as specified in Article VII of the State Sanitary Code. The Department recommends that a biweekly sampling program be established to monitor the bacteriological quality of the water in Pleasure Bay for the 1971 bathing season.

Special attention should be also directed towards investigation of the short circuiting theory from Station 1 to Station 4 by use of Dye and Float Studies.

Section II

Bathing Water Quality at L Street Beach

Location and Description - The L Street beach, bordering Columbia Boulevard from M Street to K Street, is shown in Figure 2. This beach, shown in photograph No. 3, is operated by the City of Boston and is famous as the locale of the L Street Brownies, a group of bathing enthusiasts that enjoy year-round bathing in ocean water.

Results of Task Force Studies

Phase I - Sanitary Survey

The sanitary surveys of the Task Force located two active on-shore pollution sources flowing into the L Street beach area. These pollution sources are shown in Figure 2 and are there identified as #94 - Old Harbor, N-Street extended and #95 - Old Harbor, K-Street extended.

#94 is a 48 inch circular cast iron conduit equipped with two double leaf tide gates in series and has an estimated capacity of 33.7 m.g.d.

#95 is a 36 inch circular cast iron conduit with no tide gates and has an estimated capacity of 4.8 m.g.d.

The surveys conducted on July 28, 1970 and August 13, 1970 showed minor problems of salt water intrusion into the system through #94 and, that outlet #95 was performing properly.

A survey report prepared in 1967 by Camp, Dresser and McKee entitled "Report on Improvements on the Boston Main Drainage System" (Vol. II) states, that in regard to the operation of conduit #94 and its appurtenances, "the grit and regulator sumps and dry weather connections were plugged, tide gates were missing except for one leaf and the overflow of sewage from the South Boston interceptor was discharging through the outlet #94."

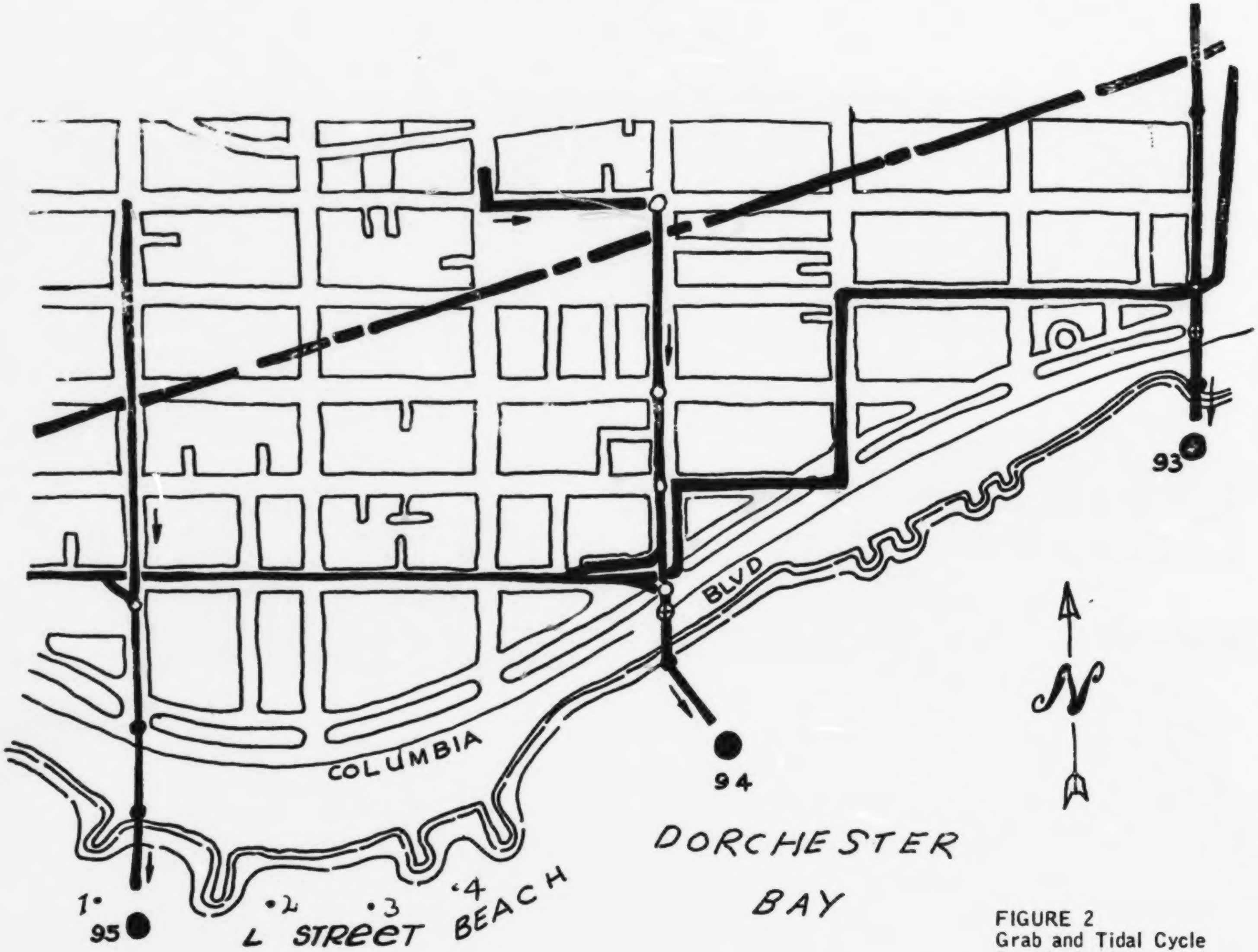
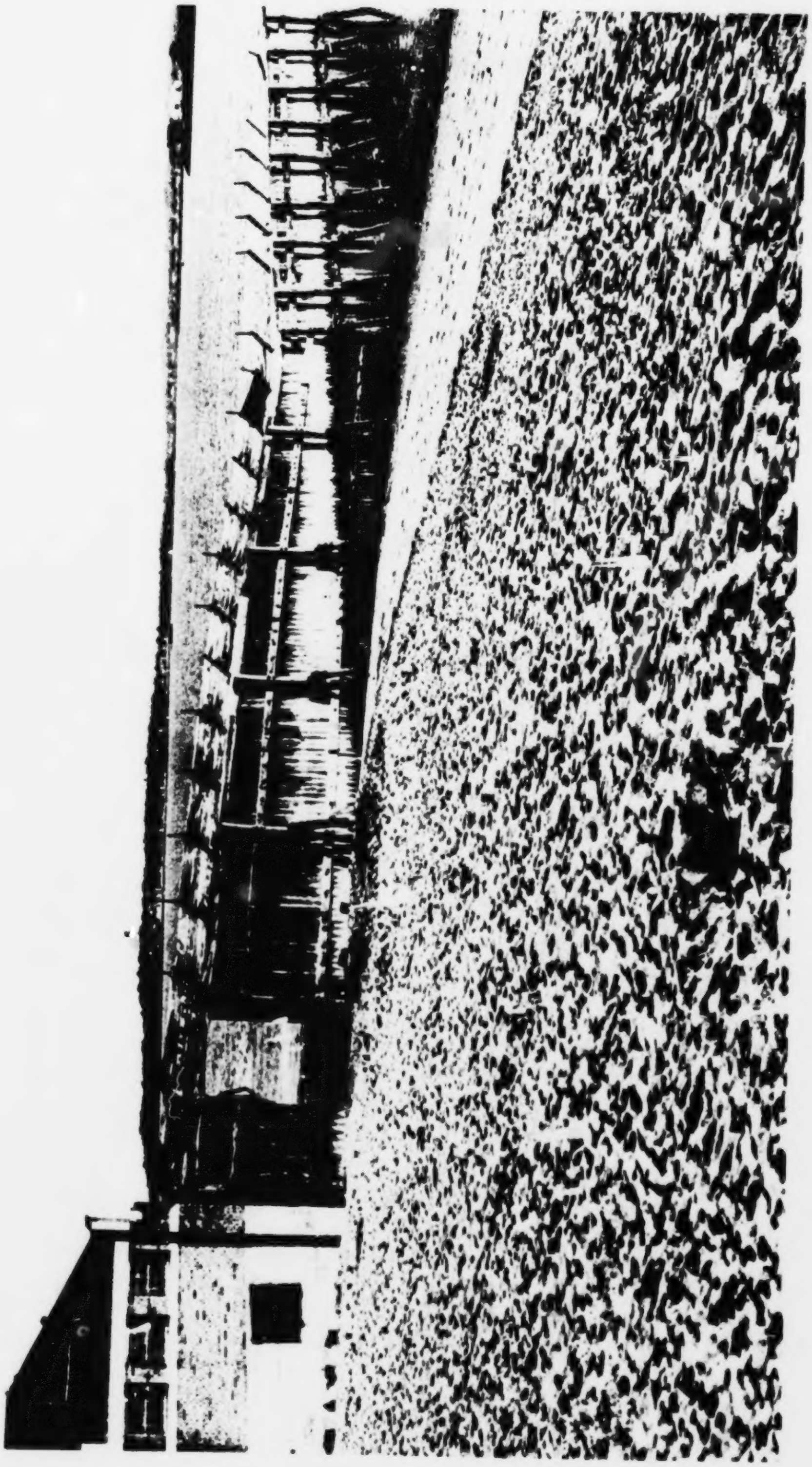

N
COLUMBIA
BLVD
93
94
95
1
2
3
4
L STREET BEACH
DORCHESTER BAY

FIGURE 2
Grab and Tidal Cycle
Sample Stations
"L" STREET BEACH



Photograph No. 3

"L" STREET BEACH - SEPT. 1970

Phase II - **Collection and Analyses of Grab Bacteriological Samples**

Four sampling stations (identified in Figure 2) were chosen to observe the bacterial quality of the water at L Street beach. During the summer months, seventeen sets of samples were collected from these stations and examined for total and fecal coliform MPN concentrations. The bacterial densities found in these samples are presented in Table 3. Also included in this Table are the time of collection, the time of high tide and the rainfall occurring twenty-four and forty-eight hours prior to the collection time.

From the bacteriological data, the median total and fecal coliform MPN densities were calculated for each sampling station and are presented in Table 13, and the number and percentages of samples from each station that exceeded the guidelines for total and fecal coliform in bathing water were determined and are listed in Table 14.

Discussion of Results - The total coliform median value calculated for each sampling station is below the 1000/100 ml guideline for bathing water, ranging from 180/100 ml at Station 2 to 730/100 ml at Station 3. The fecal coliform median values calculated for Stations 1, 2, and 4 are below the 200/100 ml guideline while that for Station 3 is slightly above the guideline, namely 210/100 ml. Judging strictly from the coliform median values calculated for all beaches studied by the Task Force (Table 13), the L Street beach exhibited the poorest bacterial quality.

The bacteriological data presented in Tables 3 and 14, indicate that the total coliform guideline is exceeded seven times or approximately 9% of all th samples analyzed. The fecal coliform guideline is exceeded twenty-three times or approximately 28% of the samples analyzed. Further analysis of this data, however, shows that of the 23 samples that exceeded the 200/100 ml fecal coliform guideline, 12 samples exhibited fecal coliform concentrations of 210 to 230/100 ml and 7 samples exhibited fecal coliform concentrations of 430/100 ml. The remaining four samples showed a 930 fecal coliform MPN.

Table 3

Bacteriological Results of Grab Samples from L Street Beach

Date	Coll.	High	Rain Within		Coliform MPN/100 ml							
					Station 1		Station 2		Station 3		Station 4	
1970	Time	Tide	24 hrs	48 hrs	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal
6/9	1010	324	-	0.07	230	230	91	36	230	36	430	91
6/10	1230	412	-	-	930	36	150	91	430	230	430	230
6/11	1115	500	-	-	<36	<36	36	<36	<36	<36	91	<36
7/6	1406	1406	-	0.66	430	36	230	36	430	430	430	91
7/8	1524	1524	-	-	91	<36	36	36	91	<36	430	91
7/13	654	654	0.22	0.23	930	430	230	230	750	230	750	36
7/21	1406	1406	-	-	430	430	210	91	230	91	930	430
7/23	1548	1548	-	-	73	<36	150	36	930	210	230	230
7/28	818	818	0.11	0.11	230	91	2400	930	2400	430	930	430
7/30	1024	1024	-	-	<36	<36	930	930	230	230	430	91
8/11	1405	618	0.93	0.93	36	36	<36	<36	36	<36	91	36
8/18	950	1248	0.53	0.53	930	230	930	<36	750	230	1500	150
8/20	1330	1430	0.45	0.45	-	-	-	-	2400	930	2400	930
8/25	1325	648	-	1.55	430	36	150	36	930	91	-	-
8/27	1240	854	-	-	430	230	2400	150	930	230	150	36
9/1	1406	1230	-	-	36	<36	36	<36	150	36	230	<36
9/3	1330	1336	.04	-	-	-	210	150	210	36	2400	430

Phase III - Effect of Tidal Cycle on Water Quality

On July 28, 1970, members of the Task Force studied the variation of the bacterial quality of water at L Street beach during a tidal cycle. Ten sets of samples collected from four stations (Figure 2) at approximately hourly intervals were analyzed for total coliform concentrations by the membrane filter procedure in a temporary field laboratory set-up at the MDC Headworks on Columbia Boulevard. The results of these analyses are presented in Table 4. The data indicates moderately high coliform concentrations present in the beach water at high tide (Runs # I and X) and excellent water quality at all stations at all other times.

Summary of Findings

1. Two active on-shore pollution sources to L Street beach were found by members of the Task Force. These conduits, labeled #94 and #95 on Figure 2, do not have operable tide gates to prevent flushing out of the sewerage system at every high tide.

2. Grab bacteriological samples from all stations exhibited median total coliform values below the guideline value and three out of the four stations exhibited median fecal coliform values below the guideline. Although Station 3 showed a fecal coliform median value exceeding the guideline, it is judged to be not significantly over the guideline.

3. The results of the Tidal Study indicate that coliform levels in the beach water increase at high tide.

4. It is not possible to assess the effect of rainfall on the bacterial quality of the bathing water at L Street beach. The data does not establish either a conclusive pattern between rainfall and bacterial densities or a definite correlation between phases of the tide and bacterial densities found at L Street beach.

Recommendations of the Department of Public Health

The sanitary survey report prevents the complete acceptance of the bathing

Table 4

L Street Beach - Survey

Bacteriological Examination

M.F. Coliform/100 ml.

Sampling

Time: 840 - 1915

Date: July 28, 1970

Rain: .11 inches

Wind Direction: S.W.

High Tide: 818

Low Tide: 1420

			Run #								
Station	Time of Collection	I 840	II 920	III 1015	IV 1115	V 1215	VI 1415	VII 1615	VIII 1730	IX 1830	X 1915
1		50	180	<10	<10	<10	<10	10	<10	<10	490
2		60	40	30	<10	<10	<10	20	<10	<10	540
3		550	10	<10	<10	<10	<10	10	<10	<10	620
4		150	50	<10	<10	10	<10	20	<10	<10	680

water at L Street beach under the provisions of Article VII, Regulation 10 of the State Sanitary Code which states in part "the water in bathing beaches shall be disapproved for bathing and swimming purposes when the results of a sanitary survey discloses sewage or other hazardous substance is or may be discharged into the bathing beach waters to a degree considered by the Massachusetts Department of Public Health to be of public health significance."

However, based on the bacteriological data accumulated by the Task Force during the 1970 bathing season, it is recommended that bathing be permitted in 1971 at L Street beach, contingent upon the fulfillment of the following recommendations:

1) tide gates must be constructed in conduits #94 and #95 and their operational condition periodically checked, and

2) A weekly bacteriological sampling program should be instituted during the bathing season and special samples should be collected after significant rainfall.

Section III

Bathing Water Quality at Carson Beach

Location and Description - Carson Beach borders Columbia Boulevard from K Street to the Bayside Shopping Center. The beach and bathhouse facility (photograph No. 4) are operated by the Metropolitan District Commission.

Results of Task Force Studies

Phase I - Sanitary Survey

The sanitary survey found five active on-shore pollution sources emptying into the Carson Beach area of Dorchester Bay. These sources are shown on Figure 3 and are identified as follows:

#95 - Old Harbor, K Street extended; a 48-inch circular cast iron conduit with no tide gates, estimated capacity of 4.8 m.g.d.

#96 - Old Harbor, H Street extended; a 60-inch circular cast iron conduit with double leaf wooden tide gate and a metal tide gate in series, estimated capacity of 151 m.g.d.

#97 - Old Harbor, Rev. R.A. Burke Street extended; double 60-inch circular cast iron conduits in parallel with two double leaf wooden gates in series, estimated capacity of 108 m.g.d.

#98 - Old Harbor, Kemp Street extended; triple 60-inch circular cast iron parallel conduits each with tide gates, estimated capacity 60.0 m.g.d.

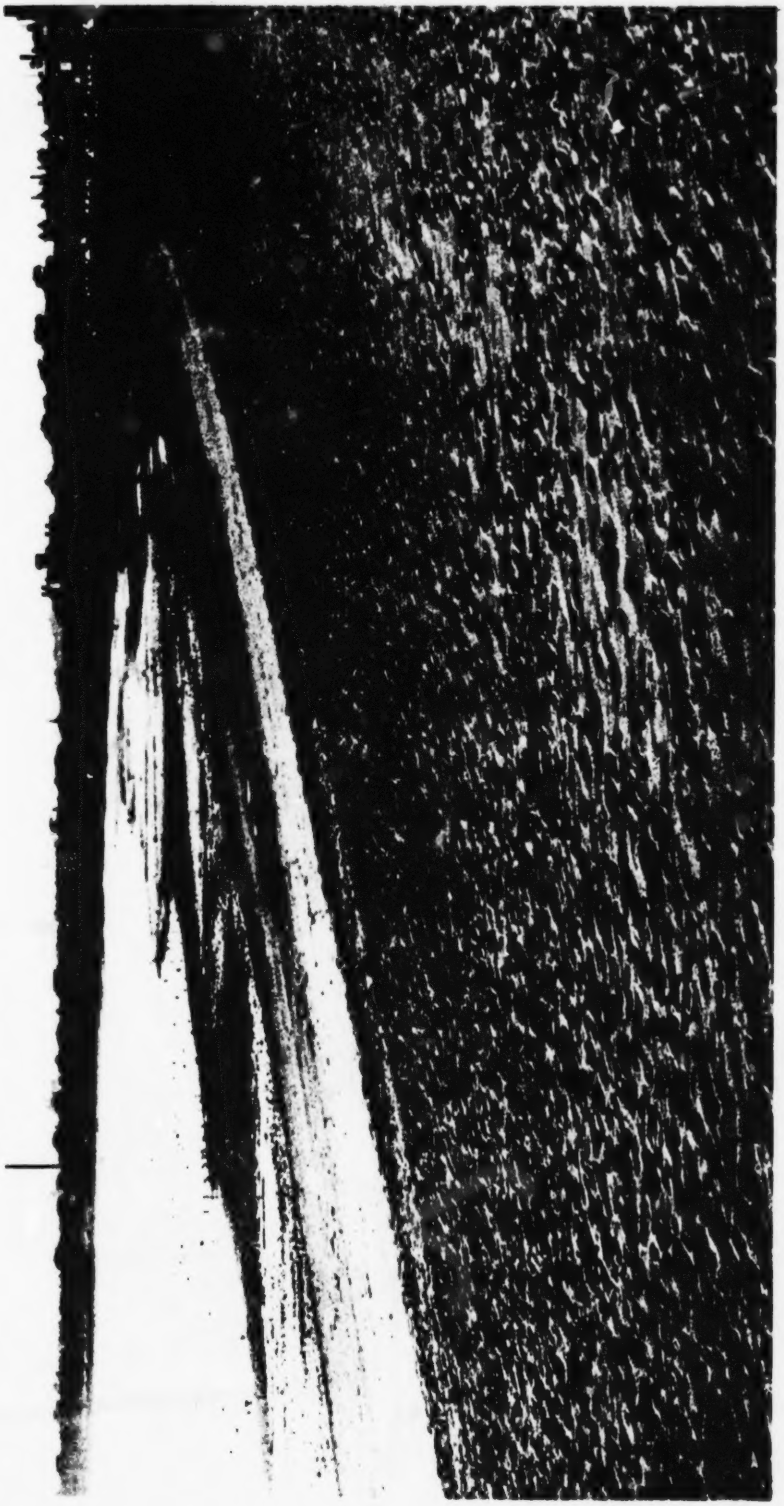
#99 - Old Harbor, Mt. Vernon Street extended; double rectangular reinforced concrete conduits with two pairs of wooden gates in series, estimated capacity 550 m.g.d.

Observations made by members of the Task Force on July 28, 1970 and August 13, 1970 indicated the following:

#95 - performing properly

#96 - examined at I Street and East Eight Street contained a small flow, bacterial analysis of the water showed a coliform concentration of 300,000/100 ml and chloride content of 3400 mg/L, indicating approximately a one percent sewage - twenty percent sea water concentration in the flow.

#97 - observed at Vale Street, showed the tide gate half open and slight flow back into the system.



Photograph No. 4   CARSON BEACH - SEPT. 1970

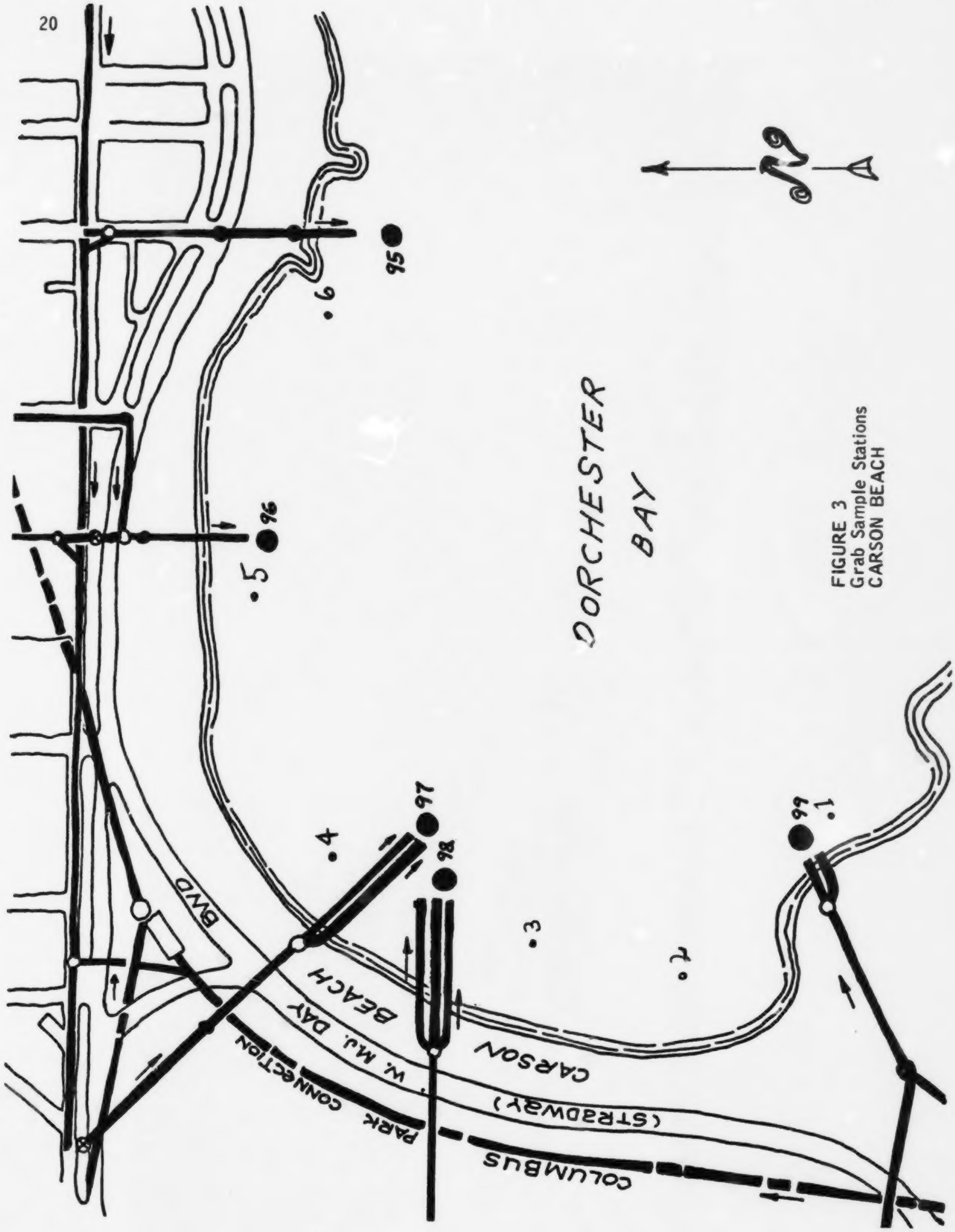

20
DORCHESTER BAY
95
96
97
98
99
.1
.2
.3
.4
.5
.6
CARSON BEACH
W. M.J. DAY BLVD
(STRANDWAY)
COLUMBUS PARK CONNECTION

FIGURE 3
Grab Sample Stations
CARSON BEACH

#98 - observed at Kemp Street, showed tide gates not operating and large flow of sea water entering the main sewerage channel at high tide.

#99 - observed at the M.B.T.A. Parking Lot at Sidney and Crescent Streets, showed a blocked sump and sewage spilling into the overflow pipe discharging to Carson Beach in the Bay Shopping Mall area.

Phase II - Collection and Analysis of Grab Bacteriological Samples

Six sampling stations (identified in Figure 3) were chosen to determine the bacterial quality of water at Carson Beach. During the bathing season, seventeen sets of samples were collected from these stations and examined for total and fecal coliform MPN concentrations. The bacterial densities found in these samples are presented in Table 5. This Table also gives the time of collection, the time of high tide and the rainfall occurring twenty-four and forty-eight hours prior to the collection time.

From the bacteriological data, the median total and fecal coliform MPN concentrations were calculated for each sampling station and are presented in Table 13 and the number and percentages of samples from each station that exceeded the guidelines for total and fecal coliform in bathing water were determined and are listed in Table 14.

Discussion of Results - The total and fecal median values calculated for each station are below the guidelines for these pollution parameters in bathing water. The total coliform median values ranged from a high of 200/100 ml to a low of 36/100 ml and the fecal coliform median value ranged from a high of 36/100 ml to less than 36/100 ml.

The data presented in Tables 5 and 14 indicate that the total coliform guideline is exceeded six times or in approximately 6% of the samples analyzed and the fecal coliform guideline is exceeded eighteen times or in approximately 18% of the samples. Of the eighteen beach water samples that exceeded the fecal coliform guideline of 200/100 ml, five samples showed a fecal coliform concentration of 230/100 ml and five samples showed a fecal coliform concentration

Table 5

Bacteriological Results of Grab Samples from Carson Beach

Coliform MPN/100 ml

Date 1970	Coll. Time	High Tide	Rain Within 24 hrs	Rain Within 48 hrs	Station 1 Total	Station 1 Fecal	Station 2 Total	Station 2 Fecal	Station 3 Total	Station 3 Fecal	Station 4 Total	Station 4 Fecal	Station 5 Total	Station 5 Fecal	Station 6 Total	Station 6 Feca
6/9	1110	324	-	0.07	36	<36	<36	<36	<36	<36	430	<36	150	<36	-	-
6/10	1300	412	-	-	230	36	<36	<36	36	36	230	230	36	36	-	-
6/11	1045	500	-	-	91	<36	<36	<36	<36	<36	<36	<36	36	<36	-	-
7/6	1145	1406	-	0.66	36	<36	150	<36	91	36	36	<36	<36	<36	36	36
7/8	1430	1524	-	-	200	<36	<36	<36	36	<36	91	<36	91	<36	200	<36
7/13	825	654	0.22	0.23	430	<36	230	91	<36	<36	<36	<36	<36	<36	230	36
7/21	1315	1406	-	-	230	<36	91	36	930	930	230	91	930	930	1500	1500
7/23	1415	1548	-	-	200	73	430	430	930	930	150	150	150	36	91	36
7/28	910	818	0.11	0.11	930	73	140	73	91	91	91	91	230	91	91	91
7/30	900	1024	-	-	91	<36	<36	<36	<36	<36	36	< 36	91	<36	430	150
8/11	1420	618	0.93	0.93	<36	<36	<36	<36	430	430	230	230	36	36	36	36
8/18	920	1248	0.53	0.53	930	150	430	91	430	230	930	91	-	-	930	430
8/20	1400	1430	0.45	0.45	91	36	230	91	11,000	11,000	1500	1500	930	430	2400	2400
8/25	1220	648	-	1.55	230	91	36	<36	36	36	<36	<36	91	36	-	-
8/27	1125	854	-	-	230	230	430	73	36	36	36	<36	91	36	430	230
9/1	1330	1230	-	-	<36	<36	<36	<36	<36	<36	36	36	91	36	36	<36
9/3	1300	1336	.04	-	2400	430	4600	4600	210	73	91	91	<36	<36	<36	<36

of 430/100 ml, leaving only eight samples out of the ninety-seven analyzed yielding fecal coliform concentrations in excess of 430/100 ml. An analysis of the bacteriological and rainfall data does not appear to support a firm conclusion concerning the effect of rainfall on the bacterial quality of the water at Carson Beach.

Phase III - Effect of Tidal Cycle on Water Quality

On July 28, 1970, members of the Task Force studied the variation that occurs in the bacterial quality of water at Carson Beach during a tidal cycle. Ten sets of samples collected from ten stations (identified in Figure 4) at approximately hourly intervals were analyzed for total coliform concentration by the membrane filter procedure in a temporary field laboratory operated at the MDC Headworks on Columbia Boulevard. The results of these analyses are presented in Table 6.

The resultant data indicate that the water at all sampling stations throughout the tidal cycle possessed moderate to low coliform densities, well below the total coliform guideline for bathing water. There appears to be no conclusive trend as to the effect of high tide on the quality of water at Carson Beach. The bacteriological examination of water samples collected at Station 1, the nearest Station to pollution source #99, does not show any signs of significant pollution.

Summary of Findings

1. The sanitary survey lists five active on-shore pollution sources emptying into the Carson Beach area of Dorchester Bay. Although one, #95, appeared to be operating properly, the remaining drains had malfunctioning appurtenances e.g. tide gates and sumps, which would under certain conditions of rainfall or high tide permit sewage to enter these conduits and eventually reach the waters off Carson Beach.

2. Grab bacteriological samples, collected throughout the bathing season, exhibited median total and fecal coliform values below the bacterial guidelines for bathing water at all sampling stations.

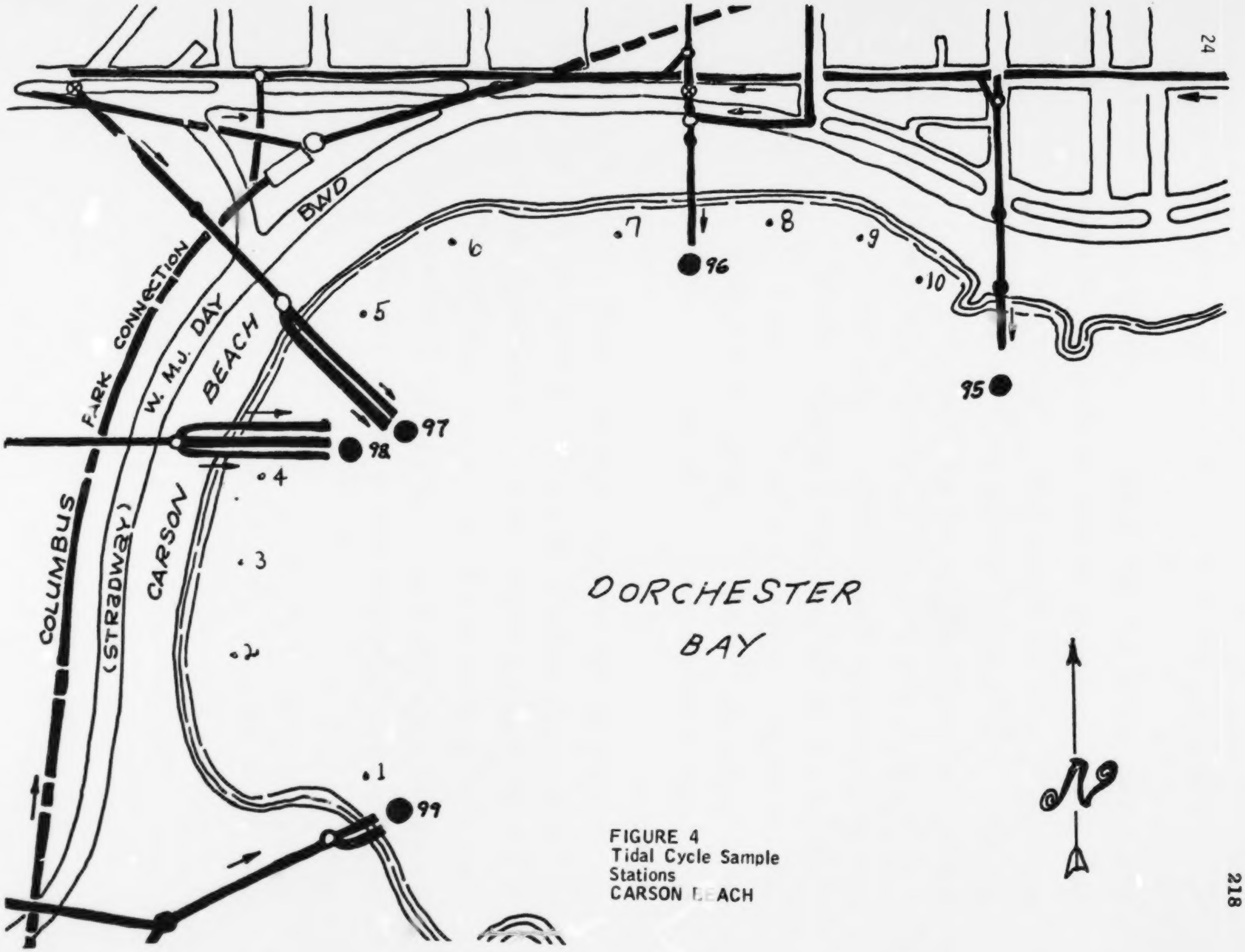

24
COLUMBUS PARK CONNECTION
(STRADWAY)
W. M.J. DAY
CARSON BEACH
BLVD
DORCHESTER BAY
N
95
96
97
98
99
1
2
3
4
5
6
7
8
9
10

FIGURE 4
Tidal Cycle Sample
Stations
CARSON BEACH

Table 6

Carson Beach Survey

Bacteriological Examination

M.F. Coliform/100 ml.

Sampling

Time - 840 - 1915

Date - July 28, 1970

Rain - .11 inches

Wind Direction - S.W.

High Tide - 818

Low Tide - 1420

		Run #									
		I	II	III	IV	V	VI	VII	VIII	IX	X
Station	Time of Collection /	840	920	1015	1115	1215	1415	1615	1730	1830	1915
1		140	80	30	50	70	400	60	60	100	140
2		50	30	10	70	70	320	80	30	80	50
3		<10	<10	100	80	20	60	100	10	30	680
4		10	<10	20	10	40	80	60	120	250	30
5		<10	<10	50	30	100	10	20	20	210	660
6		<10	<10	<10	140	80	40	200	<10	<10	120
7		<10	20	<10	<10	50	60	10	20	400	100
8		<10	<10	<10	<10	10	20	20	10	380	80
9		<10	<10	<10	20	30	10	10	240	300	260
10		60	<10	10	<10	10	20	20	70	280	280

3. No firm conclusion on the effect of rainfall on the water quality at Carson Beach can be stated.

4. The tidal study revealed no significant pollution levels in the beach area during any tidal phase.

Recommendations of the Department of Public Health

The results of the sanitary survey prohibits the complete approval of the quality of the bathing water at Carson Beach under the provisions of Article VII, Regulation 10 of the State Sanitary Code which states in part "the water in bathing beaches shall be disapproved for bathing and swimming purposes when the results of the sanitary survey discloses sewage or other hazardous substance is or may be discharged into the bathing beach waters to a degree considered by Massachusetts Department of Public Health to be of public health significance." Several on-shore pollution sources, previously listed in the sanitary survey section, are contiguous to the beach area and potentially could bring sewage or other hazardous material to the bathing area.

However, since the bacteriological data accumulated by the Task Force, during the 1970 bathing season, is in substantial agreement with our Department's bacterial guidelines for an approved bathing area, it is recommended that bathing be permitted in 1971 at Carson Beach, contingent upon the fulfillment of the following conditions:

1) The tide gate structures in the storm drain conduits must be repaired and the operation of these appurtenances periodically checked.

2) After the tide gates and regulators have been repaired, a weekly bacteriological sampling program must be instituted during the bathing season and special sets of samples must be collected subsequent to significant rainfall to determine the effectiveness of the tide gate operation.

Section IV

Bathing Water Quality at Malibu Beach

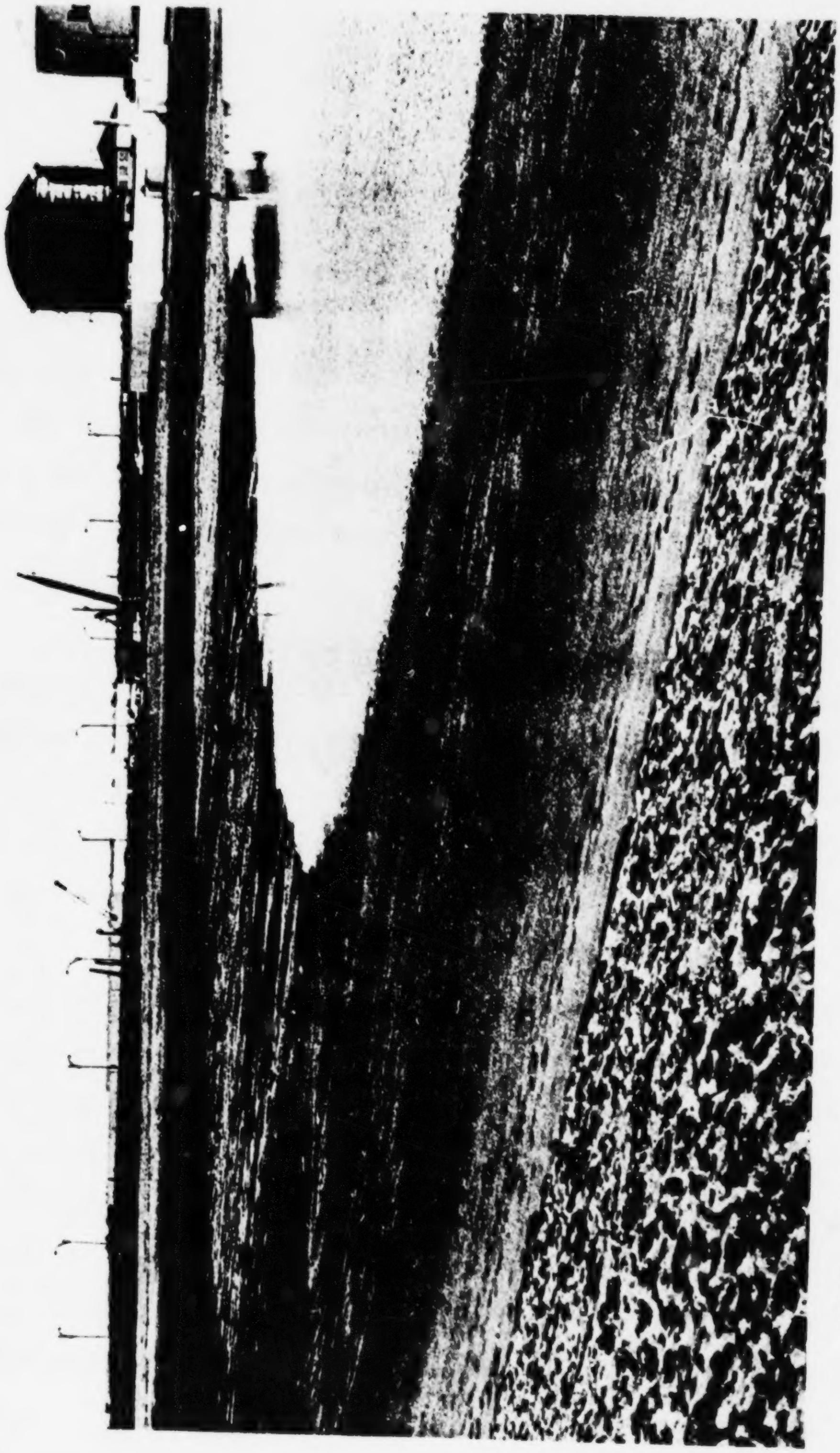
Location and Description - Malibu Beach is located in the Savin Hill section of Dorchester. It is bounded by Morrissey Boulevard on the east and the Southeast Expressway on the west. Although connected to Dorchester Bay by a narrow channel, the tidal flow cannot be regulated as in Pleasure Bay. Its protective location makes it an ideal bathing and boating area. The Metropolitan District Commission supervises the beach and its bathhouse (photograph No. 5).

Results of Task Force Studies

A sanitary survey conducted by members of the interagency Task Force found only one active on-shore pollution source that could influence the bacterial quality of bathing water of Malibu Beach. This source is shown on Figure 5 and identified as #100 (photograph No. 6), Dorchester Bay, Freeport Way extended (Dorchester Yacht Club). This structure also receives the overflow from outlet #101.

An inspection of the tide gates, sumps and regulators tributary to conduit #100 revealed many malfunctions of these appurtenances. The sump-type regulator located at Freeport and Kimball Streets had a sewage flow two inches below the overflow weir and two sets of tide gates downstream from this regulator were found to be open and inoperable. At Dorchester Avenue, in the vicinity of National Laundry, a 15" sump discharge to the Dorchester Interceptor was blocked and sewage was flowing into the overflow conduit. Sewage was also prevented from flowing into the interceptor because of a closed gate on the downstream side of this sump discharge.

In the vicinity of Savin Hill Beach and outlet #100, no sewage was being



Photograph No. 5

MALIBU BEACH - SEPT. 1970

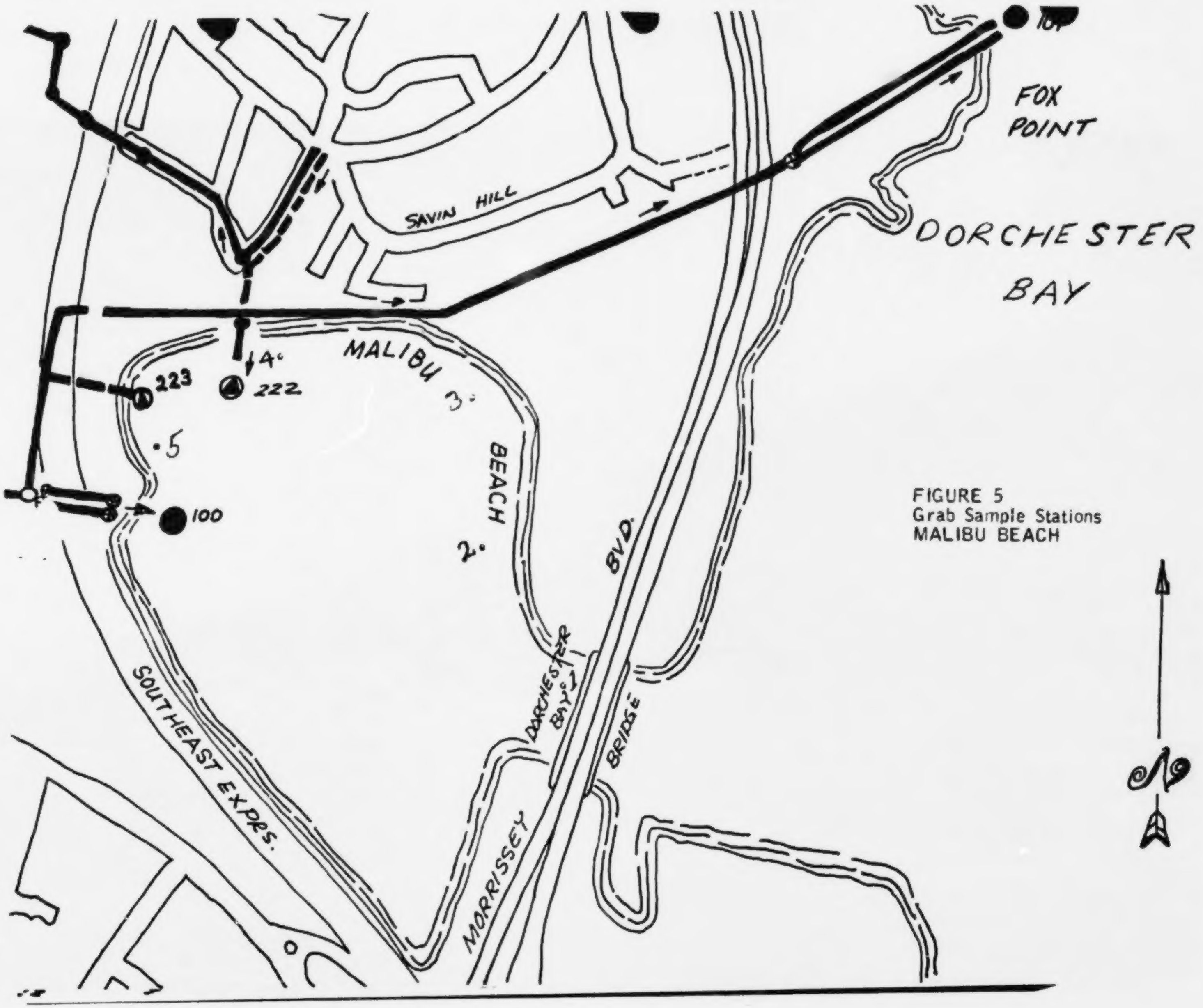

101
FOX POINT
DORCHESTER BAY
SAVIN HILL
MALIBU
BEACH
4
222
223
3
5
100
2
BVD.
DORCHESTER BAY 1
BRIDGE
MORRISSEY
SOUTHEAST EXPRS.
N

FIGURE 5
Grab Sample Stations
MALIBU BEACH

Photograph No. 6

MALIBU BEACH POLLUTION SOURCE 100 SEPT. 1970 discharged, but sewage was assumed to be passing out of conduit #101 at Fox Point. A dye study showed that outlet #223 (Figure 5) actually discharges into the low level overflow identified as #100 on the same figure.

Phase II - Collection and Analyses of Grab Bacteriological Samples

Four sampling stations, identified in Figure 5, were chosen to observe the bacterial quality of water at Malibu Beach and one station was selected to determine the quality of water entering the lagoon area from Dorchester Bay. Seventeen sets of samples were collected, during the bathing season, from these stations and examined for total and fecal coliform MPN concentrations. The bacterial densities found are presented in Table 7. The time of collection, the time of high tide and the rainfall occurring twenty-four and forty-eight hours prior to collection are also included in this Table.

From the bacteriological data, the median total and fecal coliform MPN densities were calculated for each sampling station and are presented in Table 13, and the number and percentages of samples from each station that exceeded the total and fecal coliform guidelines for bathing water were determined and are tabulated in Table 14.

Discussion of Results - The total and fecal coliform median values calculated for each beach sampling station (Stations 2 to 5) are well below the Department's guidelines for bathing water, with a high total coliform value of 91/100 ml and a high fecal coliform value of 36/100 ml. The water at Station 1, not a beach station, exhibited total and fecal coliform median values of 230/100 ml and 91/100 ml respectively.

The data presented in Tables 7 and 14 indicate that the total coliform guideline is exceeded nine times or in approximately 13% of the beach samples analyzed and the fecal coliform guideline is exceeded eleven times or in 16% of the beach samples analyzed. Upon further analyses of the fecal coliform data, it is found

Table 7

Bacteriological Results of Grab Samples from Malibu Beach

Date 1970	Coll. Time	High Tide	Rain Within 24 hrs	Rain Within 48 hrs	Coliform MPN/100 ml Station 1 Total	Station 1 Fecal	Station 2 Total	Station 2 Fecal	Station 3 Total	Station 3 Fecal	Station 4 Total	Station 4 Fecal	Station 5 Total	Station 5 Fecal
6/9	1135	324	-	0.07	930	930	36	<36	430	36	36	<36	<36	<36
6/10	1340	412	-	-	36	<36	36	36	4300	4300	36	36	36	<36
6/11	1010	500	-	-	230	230	<36	<36	36	36	<36	<36	91	36
7/6	1100	1406	-	0.66	30	91	91	36	36	<36	36	<36	230	36
7/8	1250	1524	-	-	430	<36	36	36	<36	<36	430	<36	200	<36
7/13	800	654	0.22	0.23	930	91	2400	36	73	36	150	150	36	<36
7/21	1200	1406	-	-	430	230	91	91	1500	930	<36	<36	36	<36
7/23	1245	1548	-	-	36	36	<36	<36	36	36	36	<36	36	<36
7/28	1023	818	0.11	0.11	<36	<36	36	<36	230	230	36	<36	36	36
7/30	1037	1024	-	-	150	91	<36	<36	91	91	<36	<36	36	36
8/11	1500	618	0.93	0.93	4600	4600	430	430	<36	<36	<36	<36	<36	<36
8/18	1100	1248	0.53	0.53	930	230	2400	230	11,000	930	4600	2400	11,000	230
8/20	1400	1430	0.45	0.45	2400	930	430	<36	230	36	2400	230	11,000	230
8/25	1130	648	-	1.55	91	<36	91	36	430	91	430	150	930	91
8/27	1000	954	-	-	230	91	<36	<36	91	91	91	<36	230	91
9/1	1140	1230	-	-	430	91	230	<36	930	210	210	36	930	36
9/3	1200	1336	.04	-	91	36	<36	<36	36	36	36	<36	230	36

that of the eleven beach samples that exceeded the 200/100 ml guideline, six samples exhibited fecal coliform concentrations of 210 to 230/100 ml and thus only five beach samples or approximately 7% exhibited fecal coliform concentrations greater than 230/100 ml.

The data suggest that rainfall has an influence on the bacterial quality of water at Malibu Beach. Seven out of the nine beach samples that showed excessive coliform concentrations were collected subsequent to heavy rainfall. The effect of rainfall, however, is not that conclusive, since on August 11th and 25th the water samples collected did not show high coliform densities at the beach stations even though rainfalls of 0.93 and 1.55 inches had fallen forty-eight hours prior to collection. In general, the water of poorest bacterial quality was observed most consistently at Station 1.

Phase III - Effect of Tidal Cycle on Water Quality

On July 22, 1970, members of the Task Force studied the variation that occurs in the bacterial quality of water at Malibu Beach during a tidal cycle. Eleven sets of samples collected from 10 stations (Figure 6) at approximately hourly intervals were analyzed for total coliform concentrations by the membrane filter procedure in a temporary field laboratory operated at the MDC Headworks on Columbia Boulevard. The results of these analyses are presented in Table 8.

The data indicate that the water at all sampling stations throughout the tidal cycle possessed moderate to low coliform densities, well below the Department's total coliform guideline for bathing water. The effect of high tide on the bacterial quality of the water at Malibu Beach is shown by the low coliform values found in samples collected during Runs #VI to X.

Summary of Findings

1. One active on-shore pollution source was found by the members of the

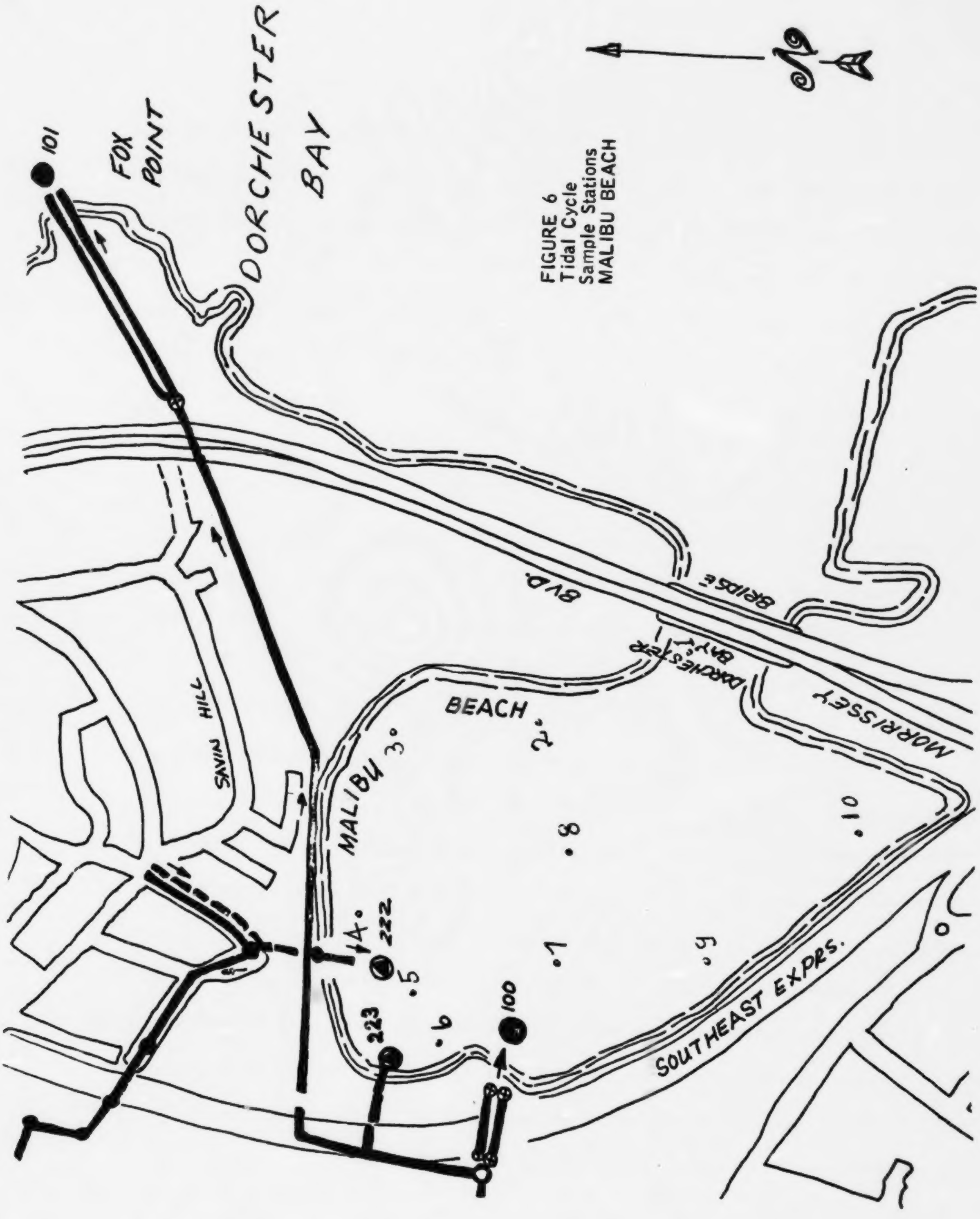

N
101
FOX POINT
DORCHESTER BAY
DORCHESTER BAY
BVD.
BRIDGE
MORRISSEY
SAVIN HILL
MALIBU BEACH
1
2
3
4
5
6
8
9
10
222
223
100
SOUTHEAST EXPRS.

FIGURE 6
Tidal Cycle
Sample Stations
MALIBU BEACH

Table 8

Malibu Beach Survey

Bacteriological Examination

M.F. Coliform/100 ml.

Sampling

Time - 800 - 1900

Date - July 22, 1970

Wind Direction - S.W.

High Tide - 2:54 P.M.

Low Tide - 8:42 A.M.

		Run #										
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI
Station	**Time of Collection**	800	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900
1		110	340	420	50	40	40	30	<10	10	20	20
2		140	240	450	70	10	<10	20	<10	110	20	20
3		130	400	240	70	30	30	10	<10	30	160	40
4		220	10	220	200	30	<10	60	<10	<10	100	100
5		140	60	700	40	40	30	50	110	10	10	20
6		100	70	280	30	30	50	110	10	10	80	10
7		140	330	270	230	50	30	20	<10	10	20	40
8		170	520	320	220	270	140	60	<10	40	10	20
9		90	370	140	180	180	40	20	10	120	20	10
10		150	430	320	190	120	10	20	10	20	20	20

Task Force. The sanitary survey indicated that many appurtenances in this conduit and its tributaries were working improperly.

2. The median bacterial levels at all beach stations calculated from the grab samples collected throughout the bathing season were found to be well below the guideline values.
3. There is evidence that high tide has an influence on the bacterial quality of the water at Malibu Beach. The effect of rainfall on water quality is not conclusive.

Recommendations of the Department of Public Health

The findings uncovered by the sanitary survey indicate that sewage may be discharged into the bathing beach waters at Malibu and thus complete acceptance of this beach under the provisions of Article VII, Regulation 10 of the State Sanitary Code which states in part "the water in bathing beaches shall be disapproved for bathing and swimming purposes when the results of a sanitary survey discloses sewage or other hazardous substance is or may be discharged into the bathing beach waters to a degree considered by the Massachusetts Department of Public Health to be of public health significance."

However, since the bacterial quality of the water at the beach stations at Malibu is judged to be of satisfactory quality during the 1970 bathing season, it is recommended that bathing be permitted in 1971 at Malibu Beach contingent upon the fulfillment of the following recommendations:

1) tide gates, sumps and regulators tributary to conduit #100 must be renovated and their operational condition periodically checked.

2) A weekly bacteriological sampling program must be established during the bathing season and special samples must be collected after significant rainfall.

Section V

Bathing Water Quality at Tenean Beach

Location and Description - Tenean Beach is a small neighborhood beach, approximately one quarter mile in length, located off Morrissey Boulevard at the foot of Freeport Street, Dorchester. The beach and its facilities; a bathhouse, snack bar, and playground, are supervised by the Metropolitan District Commission.

Results of Task Force Studies

Phase I - Sanitary Survey

The members of the Task Force conducted a sanitary survey of Tenean Beach and Tenean Bay area and found four active on-shore pollution sources. These sources are identified as #103, #105 and storm drains 7 and 8 on Figure 7. The outlets of storm drains #103 and #105 are shown in photographs 7 and 8 respectively. On the day that the sanitary survey was made, the tide gate and appurtenant structures of storm water overflow #105 were functioning properly. Although light rain was falling, the flow in this discharge line was minimal. This condition, however, does not always prevail. Significant flows from this culvert were observed on many occasions when grab samples were being collected for bacteriological analysis.

During the survey, it was observed that a sewer serving the M.D.C. skating rink at the Garvey Playground surcharges during wet weather and its overflow discharges sewage into the playground area, creating a definite health hazard. Eventually, this sewage drains into storm water conduit #105

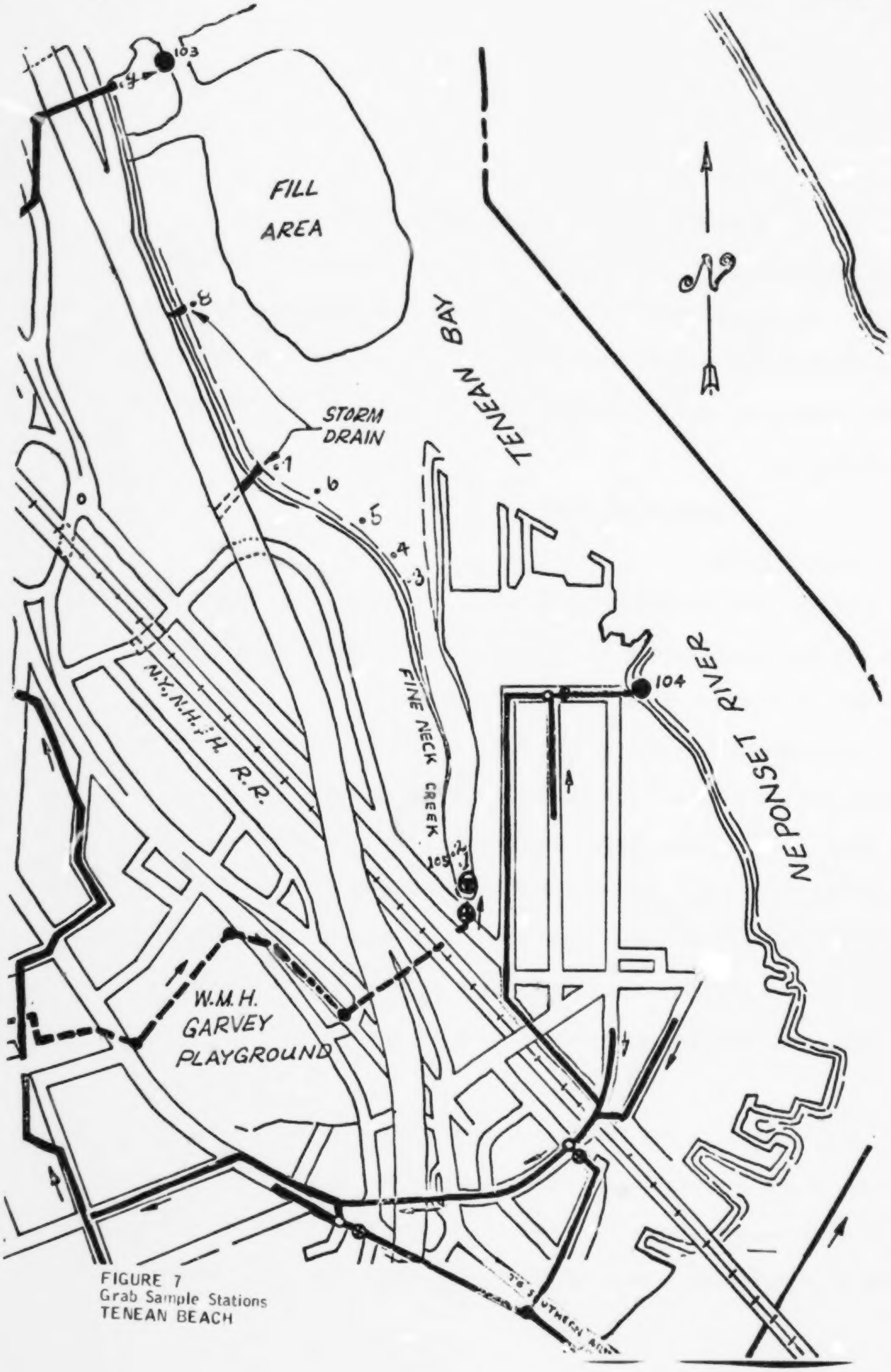
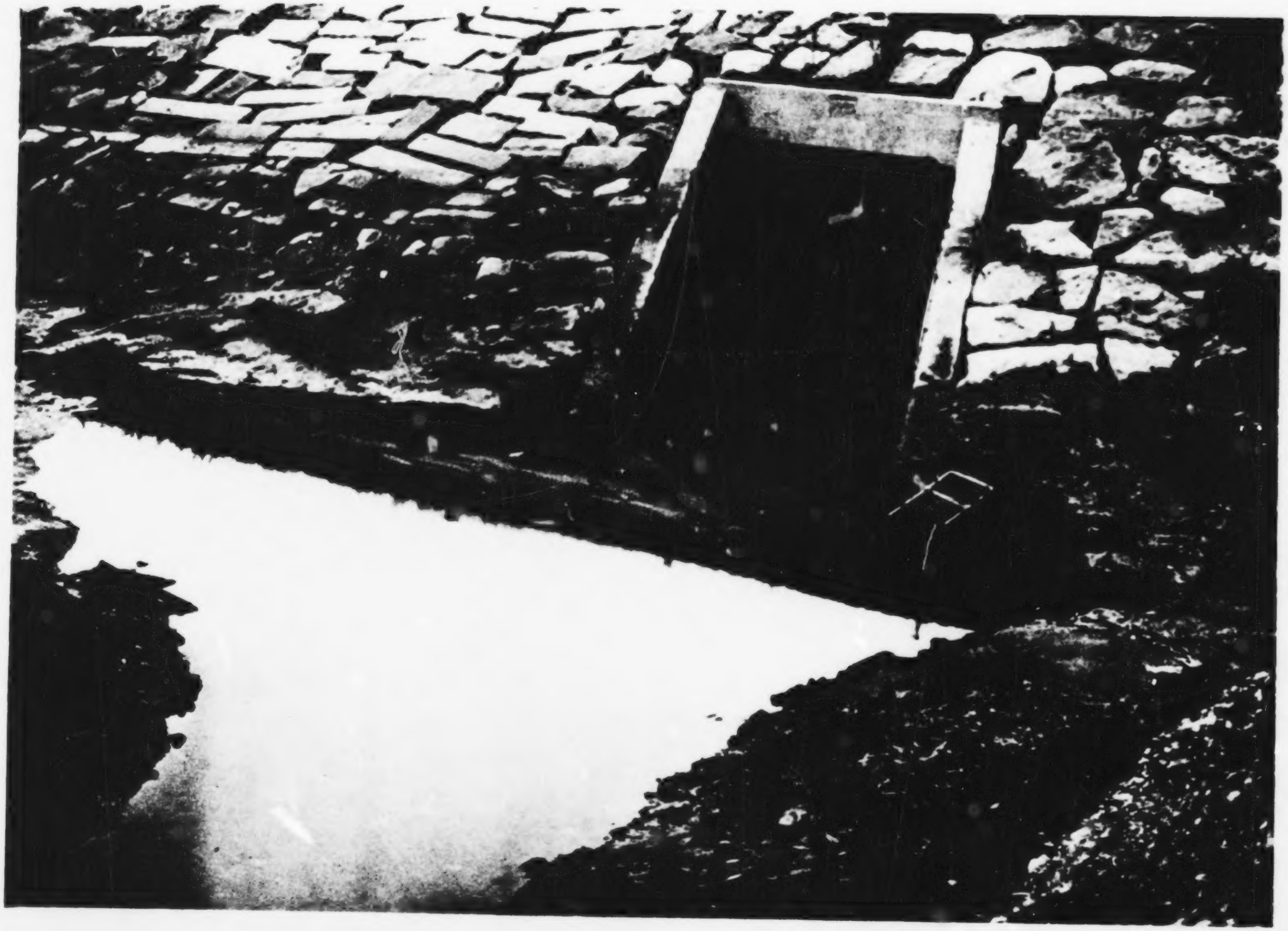

103
9
FILL AREA
8
STORM DRAIN
1
6
5
4
3
TENEAN BAY
N
FINE NECK CREEK
105
2
1
104
NEPONSET RIVER
N.Y., N.H. & H. R.R.
W.M.H. GARVEY PLAYGROUND
SOUTHEAST

FIGURE 7
Grab Sample Stations
TENEAN BEACH



Photograph No. 7 TENEAN BAY POLLUTION SOURCE #103 SEPT. 1970

Photograph No. 8

and thus contribute to the pollution at the south end of Tenean Beach. The survey of overflow #103, the so-called Victory Road culvert, revealed many unsatisfactory conditions. There are nine different sewer connections to this conduit, including one to the 54" Dorchester Interceptor which frequently surcharges due to rainfall and sea water intrusion. The regulators on thse sewer connections operate haphazardly, allowing sewage to by-pass into conduit #103. The tide gate appurtenant to this conduit was inspected and wastewater was observed streaming through this gate at low tide.

During the survey the following observations were made at the Chlorination Station installed by the Metropolitan District Commission to disinfect the wastewater discharging from #103 on outgoing tides. Large amounts of solid material had collected on the upstream side of a wooden baffle placed in this culvert. Bacterial examination of the chlorinated effluent indicated that poor bactericidal efficiency was achieved by the manual addition of an aqueous chlorine solution. Coliform concentrations of three million per 100 ml were found in these samples; equivalent to the coliform density expected in a water possessing 10% sewage.

The pollution of the Tenean Beach area is not solely associated with the malfunctioning of the sewer system in the proximity of the beach. The many inoperable and missing tide gates in the Boston Drainage System above Tenean Beach permit the entrance of enormous volumes of sea water during high tides which trigger subsequent surcharging of interceptors into conduits supposedly integrated into the system to handle only storm water overflow. The Camp, Dresser and McKee report, to the City of Boston, titled "Report on Improvements to the Boston Main Drainage System" cites just such a happenstance occurring at Haughton Street involving the surcharging of an interceptor at high tide even though the tide gate was closed. On many occasions, plugged sumps were observed causing sewage to discharge into overflow conduits emptying into the Neponset River. These aforementioned conditions, existing in the Boston Sewer System, although remote from the Tenean Beach area are directly responsible for feedbacks into the interceptors which in turn cause surcharges and eventual sewage release to the Tenean Beach area.

The major pollution problems affecting Tenean Beach appear to be associated with on-shore pollution sources, however, the proximity of the beach area to the mouth of the Neponset River and to the channel connecting this river to Dorchester Bay requires that the effect of this off-shore pollution source on the water quality at Tenean Beach be also investigated.

Phase II - Collection and Analyses of Grab Bacteriological Samples

A. Pollution Sources (on-shore)

Twenty-four sets of bacteriological samples were collected from the four on-shore pollution sources designated as sampling stations 1, 7, 8, and 9 in Figure 7. These samples were analyzed for total and fecal coliform MPN concentrations and the results are presented in Table 9. The time of collection, the time of high tide and the rainfall occurring twenty-four hours and forty-eight hours prior to collection are also included in this Table.

Discussion of Results - The excessively high total and fecal coliform concentrations found in samples collected from these storm drains indicate conclusively that waste discharges from warm-blooded animals are being

Table 9

Bacterial Pollution from On-shore Sources to Tenean Beach and Tenean Bay Area

Coliform/100 ml

Date 1970	Coll. Time	High Tide	Rain Within 24 hrs	Rain Within 48 hrs	Station 1 Total	Station 1 Fecal	Station 7 Total	Station 7 Fecal	Station 8 Total	Station 8 Fecal	Station 9 Total	Station 9 Fecal
5/12	915	448	-	-	91	36	<36	<36	36	36	430	230
5/18	1230	1000	1.25	1.60	93,000	24,000	11,000	4600	240,000	24,000	460,000	24,000
5/19	1030	1042	0.90	1.25	240,000	110,000	110,000	2300	7,500	2,400	240,000	23,000
5/20	1030	1130	-	0.90	4,600	1,500	2,400	2400	-	-	46,000	930
5/21	1530	1212	-	-	4,600	430	750	230	930	230	46,000	15,000
5/27	1030	448	0.11	0.14	240,000	2400	9,300	930	9,300	2,400	2.4×10^6	230,000
5/28	1030	548	0.02	0.11	7,500	930	430	230	11,000	930	240,000	93,000
5/29	1030	654	-	-	2,400	930	2,400	150	2,400	430	1.1×10^6	23,000
6/9	1230	324	-	0.07	4,600	430	750	200	2,400	91	46,000	24,000
6/28	1010	736	0.05	1.31	46,000	930	9,300	430	46,000	2,400	9,300	230
6/30	1140	936	0.08	0.08	750	<36	150	91	1.1×10^6	9,300	1.1×10^6	15,000
7/2	1500	1118	-	0.10	4,600	230	2,400	91	1.1×10^6	93,000	24,000	4,600
7/2*	1330	1118	-	0.10	30	<30	930	36	110,000	46,000	7,500	2,400
7/4	1710	1248	-	-	4.3×10^6	600,000	2,400	930	24,000	11,000	930,000	93,000
7/6	1040	1406	-	0.66	46,000	9,300	2,400	430	11,000	930	930	36
7/6*	1215	1406	-	0.66	15,000	930	430	<30	430	73	15,000	91

(*) Denotes samples collected by the City of Boston and analyzed by the H.V. Shuster Laboratories.

Table 9 (cont.)

Date 1970	Coll. Time	High Tide	Rain Within 24 hrs	Rain Within 48 hrs	Coliform/100 ml Station 1 Total	Station 1 Fecal	Station 7 Total	Station 7 Fecal	Station 8 Total	Station 8 Fecal	Station 9 Total	Station 9 Fecal
7/7*	1500	1448	-	-	430	36	36	<36	150	<30	430	<36
7/8	1210	1524	-	-	430	73	1,500	91	7,500	930	930	430
7/8*	1210	1524	-	-	230	36	230	36	430	<30	930	<36
7/9*	1000	1606	-	-	930	91	36	<30	24,000	200	73	<30
7/10*	900	1648	-	-	930	36	91	36	<30	<30	4600	30
7/11*	900	1736	-	-	2,400	30	<30	<30	91	30	<30	<30
7/13	730	654	0.22	0.23	240,000	930	4,600	430	930	150	91	<36
7/13*	900	654	0.22	0.23	110,000	4600	15,000	62	24,000	36	230	<30

(*) Denotes samples collected by the City of Boston and analyzed by the H.V. Shuster Laboratories.

carried by these conduits to the Tenean Beach and Tenean Bay area. On the basis that domestic sewage normally possesses a coliform concentration of from 50 to 500 million per 100 ml, the data in Table 9 indicate, on many occasions these storm drains carry wastewaters composed of from 1 to 10% sewage.

On further analysis, the data in this Table appear to indicate that there exists a marked correlation between tidal phase, rainfall, and high coliform concentration. The majority of samples showing high coliform were collected during the period of low tide or at high tide that followed a measureable rainfall within the previous forty-eight hours. It is further noted that low coliform concentrations were found in samples collected during periods of no rainfall; the sets of samples collected from 7/7 to 7/11 inclusively substantiate this observed pattern.

B. Beach Station Samples

During the bathing season, thirty-five sets of grab samples were collected for bacteriological examination at the four beach stations, identified as Stations 3 to 6 inclusive on Figure 7. These samples were analyzed for total and fecal coliform MPN concentrations and the results are presented in Table 10. The times of collection, the time of high tide and the rainfall (in.) occurring twenty-four and forty-eight hours prior to collection are also included in this Table. From the bacteriological data, the median total and fecal coliform MPN densities were calculated for each sampling station and are presented in Table 13, and the number and percentages of samples from each station that exceeded the bathing water guidelines for total and fecal coliform were determined and are listed in Table 14.

Table 10

Bacteriological Results and Classification of Grab Samples from Tenean Beach

Date	Coll.	High	Rain Within		Coliform MPN/100 ml								Classi-
					Station 3		Station 4		Station 5		Station 6		fication
1970	Time	Tide	24 hrs	48 hrs	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal	Category
5/12	915	448	-	-	11,000	1500	230	<36	36	36	230	36	II
5/18	1230	1000	1.25	1.60	46,000	2100	11,000	750	2400	930	11,000	11,000	I
5/19	1030	1042	0.90	1.25	9,300	2400	46,000	9300	-	-	9,3000	2,400	I
5/20	1030	1130	-	0.90	9,300	1500	15,000	2400	2400	230	750	430	I
5/21	1530	1212	-	-	1,500	930	930	430	930	91	-	-	II
5/27	1030	448	0.11	0.11	93,000	930	43,000	4300	24,000	930	-	-	II
5/28	1030	548	0.02	0.11	15,000	430	2,400	930	2,400	930	4,600	430	II
5/29	1030	654	-	-	930	430	2,400	930	7,500	230	930	430	II
6/9	1230	324	-	0.07	9,300	750	930	430	1,500	1500	11,000	1,500	II
6/28	1010	736	0.05	1.31	11,000	1500	4,600	430	7,500	430	4,600	230	I
6/30	1140	936	0.08	0.08	430	150	36	<36	150	36	230	230	III
7/2	1530	1118	-	0.10	91	91	36	36	91	36	<36	<36	II
7/2*	1330	1118	-	0.10	36	<36	<30	<30	<30	<30	36	<30	III
7/4	1710	1248	-	-	24,000	4600	430	91	230	36	230	91	II
7/6	1040	1406	-	0.66	930	91	230	91	230	230	15,000	230	III
7/6*	1215	1406	-	0.66	430	73	91	36	2400	30	430	91	III
7/7*	1500	1448	-	-	430	36	91	<30	<30	<30	36	<30	III
7/8	1210	1524	-	-	430	36	73	36	150	<36	930	36	III
7/8*	1210	1524	-	-	930	91	230	36	230	<30	430	36	III

Table 10 (cont.)

Date 1970	Coll Time	High Tide	Rain Within 24 hrs	Rain Within 48 hrs	Coliform MPN/100 ml Station 3 Total	Station 3 Fecal	Station 4 Total	Station 4 Fecal	Station 5 Total	Station 5 Fecal	Station 6 Total	Station 6 Fecal	Classi-fication Category
7/9*	1000	1606	-	-	91	<30	230	<30	30	<30	<30	<30	II
7/10*	900	1648	-	-	750	30	150	30	<30	<30	36	<30	II
7/11*	900	1736	-	-	430	91	<30	<30	150	36	91	91	II
7/13	730	654	0.22	0.23	24,000	4,600	24,000	930	46,000	1200	24,000	930	I
7/13*	900	654	0.22	0.23	4,600	210	11,000	750	11,000	230	4,600	390	I
7/21	1220	1406	-	-	150	73	36	36	<36	<36	<36	<36	III
7/23	1350	1548	-	-	73	<36	91	<36	36	<36	73	36	III
7/28	1035	818	0.11	0.11	36	36	36	36	36	36	36	36	III
7/30	1050	1024	-	-	930	230	91	36	430	230	230	91	III
8/11	1515	618	0.93	0.93	150	36	91	<36	91	91	36	36	I
8/18	1120	1248	0.53	0.53	11,000	1500	4600	2400	4600	930	930	430	I
8/20	1430	1430	0.45	0.45	1500	750	4600	430	230	91	930	230	I
8/25	648	648	-	1.55	24,000	9300	73	<36	430	<36	36	36	I
9/27	854	854	-	-	930	930	230	91	230	91	430	150	III
9/1	1205	1230	-	-	150	<36	430	<36	430	36	230	36	III
9/3	1223	1336	0.04	-	430	430	430	230	36	36	91	36	III

* Boston Health Department Data - H.V. Shuster Laboratory

Discussion of Results - The total coliform median values calculated for all beach sampling stations are below the guideline for bathing water. The median coliform value found for Station 3, namely 930/100 ml, indicates the poorest quality bathing water at this sampling point; quite possibly directly associated with the wastewater discharging from culvert #105 to the south end of the beach. All other beach sampling stations showed median coliform values of 230/100 ml.

The fecal coliform median values calculated for three out of the four beach sampling stations are below the bathing water guideline. A median fecal coliform value of 430/100 ml was calculated for Station 3 and confirms the total coliform finding that the highest pollution is present at this sampling point.

The analysis of the grab sample data presented in Table 14 shows that 24 to 43 percent of the grab samples collected at the various beach stations exceeded the total coliform guideline value of 1000/100 ml and that 35 to 54 percent of the samples from individual stations exceeded the fecal coliform guideline of 200/100 ml for bathing water. It is quite apparent that the magnitude of bacterial pollution at Tenean Beach is much greater than the levels previously reported at Pleasure Bay, Carson, "L" Street, and Malibu Beaches.

Rainfall and tidal phases have a pronounced effect on the quality of water at Tenean Beach. This effect can be shown most strikingly by assigning each set of grab samples to one of the following classification categories.

Category I - Samples collected subsequent to a 0.25 inch of rainfall in the preceeding 24 hours or a 1.0 inch of rainfall in the preceeding 48 hours.

Category II - Samples collected three hours on either side of low tide.

Category III - Samples collected three hours on either side of high tide.

Under this classification system, each set of samples was assigned to the appropriate category as listed in Table 10. The number of individual samples in each category that exceeded the total and fecal coliform guidelines was determined and the percentage of samples falling into each category was calculated. These data are presented in Table 11. The effects of rainfall and tidal phases on the bacterial quality of the bathing water at Tenean Beach is readily apparent. Seventy-seven percent of the samples falling into Category I exceed the total coliform guideline, forty-one percent of the samples in Category II and only 5.1% of the samples assigned to Category III showed excessive coliform concentrations. Analysis of the fecal coliform results revealed a similar pattern; over seventy-nine percent of the samples in Category I, forty-four percent of the samples in Category II and seventeen percent of the samples in Category III exhibited excessive fecal coliform concentrations above the guideline. If the samples falling into Categories I and II are grouped, fifty-nine percent fail to meet the total coliform guideline and sixty-one percent do not meet the fecal coliform guideline. Under this classification system, analysis of the bacteriological data indicate that the quality of water at Tenean Beach is unsatisfactory for bathing 1) either following 0.25 inch of rainfall in the preceeding 24 hours or 1.0 inch of rain in the preceeding 48 hours and 2) three hours before and after low tide even in the absence of any significant prior rainfall.

Phase III - Effect of Tidal Cycle on Water Quality

On July 16, 1970, members of the task force studied the variations in the bacterial quality of water at Tenean Beach during a complete tidal cycle.

Table 11

Classification of Samples Collected at Tenean Beach

	Category I	Category II	Category III	Category I & II
Number of Samples	39	39	59	78
Total Coliform Guideline				
Number in excess	30	16	3	46
Percentage in excess	77	41	5.1	59
Fecal Coliform Guideline				
Number in excess	31	17	10	48
Percentage in excess	79.5	44	17	61.5

Ten sets of samples were collected from the fourteen stations identified in Figure 8, at approximately hourly intervals, and were analyzed for coliform and chloride concentrations in a temporary field laboratory operated at the MDC Headworks on Columbia Boulevard. The results of these analyses for each sample are reported in Table 12.

Five of the fourteen sampling stations were located at on-shore pollution sources (Stations 1, 2, 7, 8, and 9), four were located along the beachfront (Stations 3 to 6 inclusive), and the remaining five were located at the mouth of the Neponset River and the channel connecting this river to Dorchester Bay (Stations 10 to 14 inclusive).

During the morning of July 16th, heavy rain fell on the drainage area contiguous to Tenean Beach. This occurrence was most fortunate since it permitted the evaluation of the water quality at Tenean during a period when on-shore pollution sources were discharging into the beach area. The analytical data presented in Table 12 clearly demonstrate the effect of tidal phases on the bacterial and chemical quality of the water at the on-shore pollution sources. At high tide, the storm drains are covered by ocean water and thus it is not surprising to find low coliform and high coliform concentrations at Stations 1, 2, 7, 8, and 9 during sampling run #1. As the tide receded the storm drains became exposed and wastewaters flowed freely into the shore areas. For almost three hours between sampling runs # V and VII, the effluent of the conduits at Stations 1 and 9 exhibited coliform concentrations in excess of 100,000/100 ml and lowest chloride titers. Storm drains located at Stations 2, 7, and 8 also showed significant increases in coliform densities during sampling runs that bracketed low tide. Finally, on incoming tide it was observed that

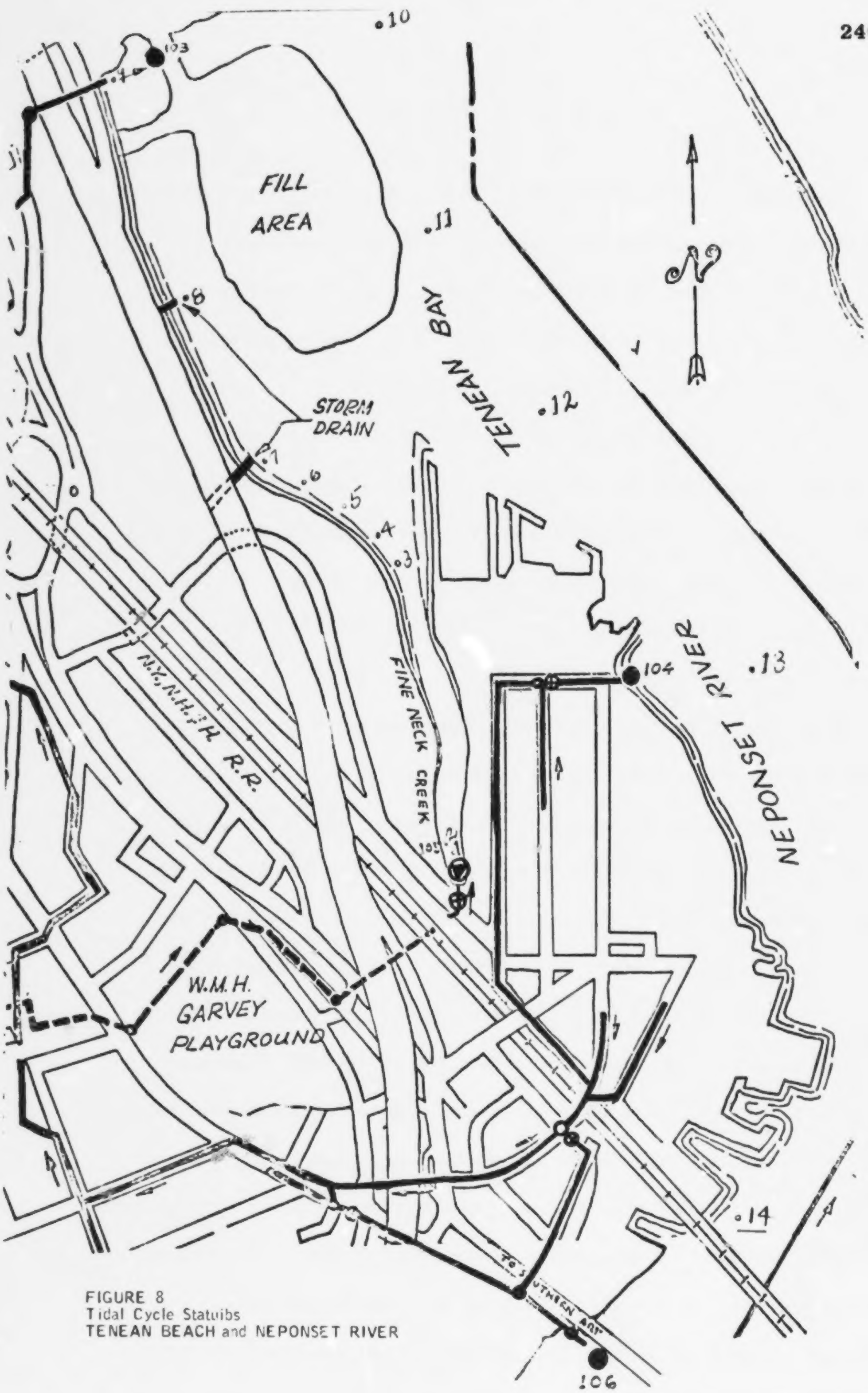

.10
103
FILL AREA
.11
.8
STORM DRAIN
.7
.6
.5
.4
.3
TENEAN BAY
.12
N
FINE NECK CREEK
104
NEPONSET RIVER
.13
N.Y.N.H.&H. R.R.
105
.2
.1
W.M.H. GARVEY PLAYGROUND
.14
TO SOUTHERN ART
106

FIGURE 8
Tidal Cycle Statuibs
TENEAN BEACH and NEPONSET RIVER

Table 12

TENEAN BEACH AND NEPONSET RIVER SURVEY

Bacteriological Examination

Sampling

Time: 9:42 A.M. - 8:15 P.M.

Date: July 16, 1970

Wind Direction - S.W.

High Tide - 9:42 A.M.

Low Tide - 3:42 P.M.

				RUN #						
Station	I	II	III	IV	V	VI	VII	VIII	Ix	X
1 MF Coliform/100 ml	200	200	200	9000	160,000	250,000	130,000	60,000	2900	1400
Chloride, %	1.62	1.72	1.72	1.24	0.78	0.36	0.32	1.36	1.52	1.66
Time of Collection	9:42	10:53	12:05	12:55	2:29	3:33	5:10	6:13	7:18	7:47
2 MF Coliform/100 ml	100	600	200	2400	40,000	25,000	9,000	8,000	3400	2500
Chloride, %	1.66	1.70	1.40	0.78	1.24	0.70	1.16	1.36	1.48	1.58
Time of Collection	9:44	10:53	12:05	1:00	2:30	3:30	5:05	6:10	7:18	7:50
3 MF Coliform/100 ml	90	160	390	310	25,000	3,500	3,000	130	1700	1500
Chloride, %	1.64	1.70	1.66	1.58	1.40	1.30	1.44	1.54	1.66	1.64
Time of Collection	9:48	10:52	12:03	1:05	2:34	3:35	5:15	6:17	7:17	7:51
4 MF Coliform/100 ml	110	80	90	400	3,500	340	2,000	510	900	3000
Chloride, %	1.64	1.74	1.72	1.68	1.52	1.60	1.50	1.56	1.68	1.72
Time of Collection	9:52	10:51	12:02	1:06	2:35	3:39	5:18	6:21	7:16	7:53
5 MF Coliform/100 ml	70	240	190	240	40	220	3,000	190	2400	1700
Chloride, %	1.68	1.76	1.72	1.70	1.52	1.60	1.55	1.58	1.68	1.68
Time of Collection	9:56	10:49	12:01	1:07	2:40	3:41	5:20	6:25	7:15	7:54
6 MF Coliform/100 ml	10	140	100	20	-	-	300	-	900	3800
Chloride, %	1.70	1.76	1.72	1.68			1.42		1.74	1.68
Time of Collection	10:00	10:48	12:00	1:08			5:25		7:14	7:55

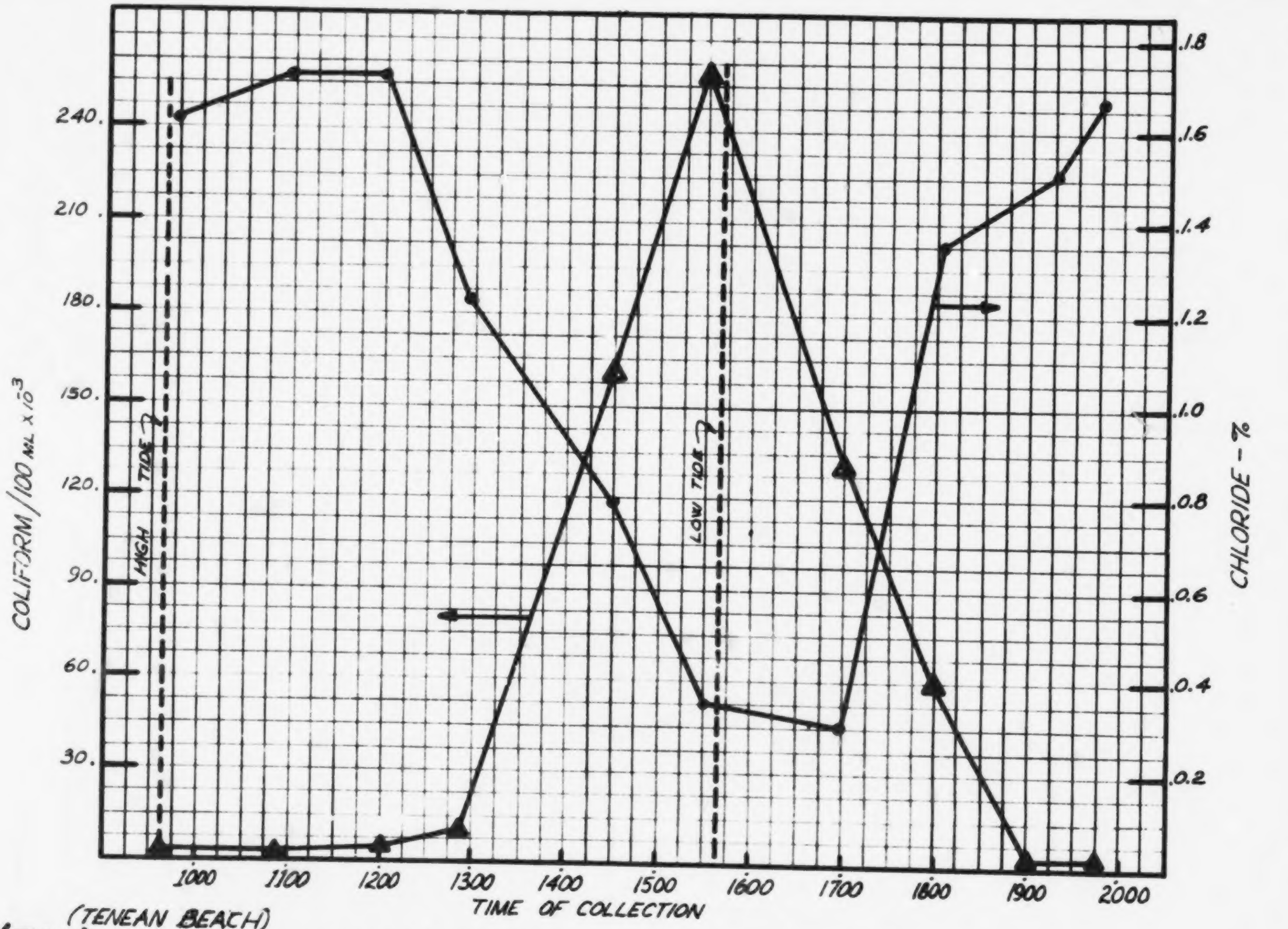
Table 12 (cont.)

Station		RUN # I	II	III	IV	V	VI	VII	VIII	IX	X
7	MF Coliform/100 ml	150	300	11,000	3200	22,000	24,000	850	2500	1800	3200
	Chloride, %	1.70	1.74	1.12	1.68	0.14	0.18	1.50	1.44	1.68	1.74
	Time of Collection	10:04	10:47	11:57	1:09	2:43	3:45	5:30	6:26	7:15	7:56
8	MF Coliform/100 ml	300	50	1700	120,000	54,000	15,000	1,000	50,000	2200	4000
	Chloride, %	1.70	1.74	1.66	0.68	0.34	0.26	1.46	1.08	1.72	1.76
	Time of Collection	10:10	10:43	11:55	1:12	2:45	3:49	5:45	6:30	7:15	7:58
9	MF Coliform/100 ml	250	700	2400	20,000	24,000	150,000	400,000	120,000	110,000	60,000
	Chloride, %	1.62	1.76	1.64	1.26	1.08	0.78	0.64	0.98	0.78	1.50
	Time of Collection	10:15	10:40	11:53	1:20	2:55	3:55	5:40	6:35	7:10	8:00
10	MF Coliform/100 ml	130	210	70	120	2000	1000	2800	2000	2700	2100
	Chloride, %	1.74	1.74	1.64	1.60	1.50	1.56	1.56	1.62	1.70	1.70
	Time of Collection	10:20	10:37	11:50	1:21	2:30	3:00	5:22	6:05	7:00	8:05
11	MF Coliform/100 ml	80	60	220	210	1500	2000	300	400	1600	210
	Chloride, %	1.72	1.74	1.70	1.60	1.50	1.58	1.58	1.60	1.74	1.74
	Time of Collection	10:21	10:39	11:53	1:23	2:31	3:01	5:23	6:07	7:02	8:06
12	MF Coliform/100 ml	20	200	150	200	3100	900	1800	350	420	160
	Chloride, %	1.74	1.68	1.70	1.55	1.46	1.52	1.52	1.55	1.74	1.74
	Time of Collection	10:23	10:38	11:50	1:25	2:32	3:03	5:24	6:10	7:04	8:10
13	MF Coliform/100 ml	300	600	300	4300	[illegible]	10,000	3000	700	1900	200
	Chloride, %	1.66	1.72	1.64	1.50	1.42	1.40	1.48	1.50	1.58	1.78
	Time of Collection	10:25	10:35	11:48	1:27	2:40	3:05	5:27	6:15	7:10	8:12
14	MF Coliform/100 ml	600	400	400	1300	6000	8000	7000	11,000	3200	200
	Chloride, %	1.62	1.66	1.60	1.36	1.32	1.26	1.36	1.44	1.62	1.74
	Time of Collection	10:30	10:30	11:42	1:30	2:45	3:15	5:35	6:20	7:17	8:15

the coliform densities at these storm drain stations decreased and the chloride concentrations increased. Upon completion of the tidal cycle, the culverts were again covered by ocean water and their drainage aborted by tidal pressure.

Figure 9 presents graphical profiles of the coliform and chloride concentrations occurring at Station 1 (on-shore pollution conduit #105) during the tidal cycle. The inverse relationship that exists between the coliform and chloride concentrations during the tidal cycle is readily apparent. Similar profiles can be graphed from the analytical data obtained at Station 9 during the tidal study. At high tide, this sampling station exhibited a 250/100 ml coliform density and 1.62% chloride titer while at low tide a coliform level of 150,000/100 ml and a chloride concentration of 0.78% was found.

The samples collected at the beach stations (3 to 6 inclusive) exhibited the same coliform and chloride fluctuations as the on-shore pollution stations during the tidal cycle. At the beach stations, however, the magnitude of these fluctuations were not as pronounced. It was observed that during low tide the coliform levels at these beach stations often exceeded the bathing water guideline. Station 3 during runs # V, VI, and VII showed persistently high coliform concentrations, quite possibly due to wastewater, discharging from Station 1, short-circuiting along the shore to this sampling point. Excessive coliform densities were also observed at Stations 4 and 5 during certain stages of low tide. The results of the chloride determinations on the beach water confirms the observation that on-shore storm water drainage reaches the beach area at low tide; Station 3, for example, exhibited a



(TENEAN BEACH)

(FIG. 9) COLIFORM-CHLORIDE CONCENTRATION AT STATION #1 THRU TIDAL CYCLE.

chloride concentration of 1.64% at high tide and 1.3% at low tide, indicating a 20% dilution by storm water.

The samples, collected during the tidal cycle from the five stations (10 to 14 inclusive) at the mouth of the Neponset River and in the channel directly off Tenean Beach, showed a similar tidal pattern for coliform and chloride concentrations as the other selected sampling stations. On outgoing tide the coliform increased and the chloride decreased and on incoming tide the reverse occurred. The highest coliform densities were found at Stations 13 and 14 during low tide and indicate the pollution load entering the channel from the Neponset River. Figure 8 shows that sampling Station 14 is located close to overflow #106, a pollution source. The bacteriological data of the channel stations (10, 11, and 12) indicate that the pollution at the mouth of the Neponset is diluted by ocean water as it passes through the channel. The moderately high coliform densities present at Station 10 from low to high tide is quite possibly associated with the discharge of wastewater from the Victory Road culvert at Station 9. It was observed that the bacterial quality of the ocean water at Stations 11 and 12 during high tide and for several hours preceeding and subsequent to high tide did not exceed the adopted coliform guideline for bathing water. It is thus projected that drainage from the Neponset River will not have an adverse effect on the quality of water at Tenean Beach during a period of a few hours before and after high tide.

Summary of Findings

1. The sanitary survey located four on-shore pollution sources discharging sewage-laden waters into areas adjacent to Tenean Beach.

2. The sewer serving the M.D.C. Skating Rink at the Garvey Playground was found to surcharge during wet weather, discharging waste-water to the playground area and eventually to a storm drain emptying in the vicinity of Tenean Beach.

3. Tidal phases and rainfall intensities do have an effect on the bacterial quality of water at Tenean Beach. Excessive numbers of samples that contained total and fecal coliform concentrations over the established bathing water guidelines were collected at beach stations either at low tide or subsequent to a rainfall of 0.25 inch during the preceding 24 hours or 1.0 inch during the preceding 48 hours. The bacterial quality of water at Tenean Beach was found to be acceptable during a period three hours before and after high tide provided the rainfall did not exceed these intensities.

4. The Neponset River does not appear to have a marked effect on the bacterial quality of the water at Tenean Beach.

Recommendations of the Department of Public Health

The presence of the four active pollution sources in the immediate vicinity of Tenean Beach coupled with the excessive numbers of beach water samples that showed total and fecal coliform densities above the Department's guidelines prevent the complete approval of the water at Tenean Beach for bathing.

Article VII, Regulation 10 of the State Sanitary Code specifies that, the water at bathing beaches shall be disapproved for bathing and swimming purposes when a sanitary survey discloses that sewage is or may be discharged into the bathing beach waters to a degree considered by the Massachusetts Department of Public Health to be of public health significance. The bacteriological examination of the effluents from several storm drains, emptying in the vicinity of Tenean Beach, indicate conclusively that sewage is being transported by these conduits.

Article VII, Regulation 10 of the State Sanitary Code also specifies that the water at bathing beaches shall be disapproved for bathing and swimming purposes when the bacteriological quality of the bathing beach waters indicates that sewage is being discharged into the bathing area. Bacteriological samples collected at Tenean Beach, during this study, indicate that unsatisfactory levels of total and fecal coliform bacteria are present during the following periods a) three hours before and after low tide, and b) subsequent to a rainfall of 0.25 inch during the preceding 24 hours and 1.0 inch during the preceding 48 hours.

The Department of Public Health recommends that bathing at Tenean Beach be permitted during a period three hours before and after high tide provided that the rainfall during the previous 24 and 48 hours does not exceed 0.25 and 1.0 inch respectively. This recommendation is based on the lack of epidemiological evidence that the Department is aware of implicating the water at Tenean Beach with disease outbreaks and on the judgment that the bacteriological quality of water at Tenean Beach, during this period, is in agreement with the bacterial guidelines and thus does not pose a health hazard. The beach should be closed for 24 hours following the above rainfall intensities.

This recommendation of the Department of Public Health is contingent upon the compliance by the City of Boston and the Metropolitan District Commission with the following actions:

1) Malfunctions of tide gates, regulators and sumps in the sewerage system associated with the Tenean Beach area must be corrected.
2) Inspection and prepared reports on the working condition of these appurtenances must be made on a regular schedule.
3) The City of Boston must immediately eliminate the health hazard existing at the Garvey Playground.
4) A weekly bacteriological sampling program must be instituted at the beach stations by the City of Boston and the Metropolitan District Commission during the recommended bathing periods.
5) The M.D.C. lifeguards must enforce the bathing restrictions at Tenean Beach and keep the beach free from visible pollution, i.e., paper, rags, bottles, etc.

Table 13

Median Coliform MPN Values Calculated from Grab Sample Data

Beach	Station 1		Station 2		Station 3		Station 4		Station 5		Station 6	
	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal
Pleasure Bay	230	36	91	<36	91	<36	91	64	36	36	-	-
L Street	430	36	180	36	730	210	430	91	-	-	-	-
Carson	200	<36	91	<36	36	36	91	36	91	36	200	36
Malibu	230	91	36	<36	91	36	36	<36	91	36	-	-
Tenean	-	-	-	-	930	430	230	36	230	36	230	91

Table 14

Percent of Samples that Exceeded Bacteriological Guidelines

Beach		Station 1		Station 2		Station 3		Station 4		Station 5		Station 6	
		Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal	Total	Fecal
Pleasure Bay	No.	7	7	0	1	0	1	0	6	0	1		
	%	41.2	41.2	0.0	5.9	0.0	5.9	0.0	37.4	0.0	7.2		
L Street	No.	0	5	2	3	2	9	3	6				
	%	0.0	33.0	12.5	18.7	11.7	52.9	18.7	37.5				
Carson	No.	1	2	1	2	1	5	1	3	0	2	2	4
	%	5.9	11.8	5.9	11.8	5.9	29.4	5.9	17.7	0.0	12.5	15.4	30.8
Malibu	No.	2	6	2	2	3	5	2	2	2	2		
	%	11.8	35.3	11.8	11.8	17.7	29.4	11.8	11.8	11.8	11.8		
Tenean	No.					15	19	11	14	11	12	8	13
	%					43.	54.4	31.4	40.0	32.4	35.2	24.2	39.4

SUMMARY

In all of the foregoing recommendations and requirements, the Department of Public Health wishes to emphasize that its role in determining the safety and suitability of bathing waters in the Dorchester Bay is that of an approving agency. Responsibility for the cost and maintenance of tide gates and other works, enforcement of restrictions regarding hours of bathing, collection of reporting of samples and the physical cleanliness of beach areas are all responsibilities which must be assumed by the appropriate responsible government agency i.e., M.D.C. and the City of Boston.

MR. QUARLES: I think the record should be entirely clear at least on a national basis -- and I am not sure of the extent to which this applies to different specific situations here locally -- but in many cases the slowness of moving forward with adequate abatement programs has been attributable to the lack of Federal funding, and in particular to the failure on the part of the Federal Government to fulfill the promises, if you can call them that, held out by the Clean Waters Restoration Act of 1966 which projected at that time rapidly increasing levels of Federal funding.

One of the prime objectives which faced the Environmental Protection Agency at its inception, which coincided with a very dramatic increase in the level of the Federal funding, was to make sure that there was a corresponding momentum developed in the State and city level to take advantage of that funding.

I was trying to follow as best I can, not having technical background personally, the data that you presented on the levels of bacteria from your samples.

I think that Mr. Stein a moment ago was focusing on the distinction between shellfish areas being open on what I believe you would describe as the restricted basis in comparison to being open on an absolutely free basis to individual citizens to harvest shellfish and take them home for household enjoyment. Did I understand you correctly to say that the basis for your making these classifications is the amount of bacteria found in samples of the overlying water rather than any judgment as to the shellfish themselves or --

MR. COLLINS: We analyzed the shellfish also, but the criterion is the overlying water.

MR. QUARLES: And the cutoff point is 70 --

MR. COLLINS: 70.

MR. QUARLES: -- per 100 ml?

MR. COLLINS: Yes.

MR. QUARLES: The figures which you were reciting a few minutes ago seemed to vary quite substantially as to the levels even if you excluded those levels from earlier years before chlorination was adopted. It seemed to me as I heard them -- and I confess they came at me probably too fast for me to absorb them clearly --

MR. COLLINS: They were very substantial levels 2 years ago.

MR. QUARLES: Right.

MR. COLLINS: Very substantial levels. I am pointing out there is a marked improvement here.

MR. QUARLES: That was obvious.

Now, limiting yourself to the levels of bacteria which were observed in the recent samples only, can you describe the general range in which they fall as to the number of bacteria per 100 ml?

MR. COLLINS: They were running-- All I have is the random. Talking about 1968, there was one showing a value of 460,000. Now that could be sampling error, could be a number of factors. We threw that in to show we have a valid array. But the important point is the median values.

This is Deer Island outfall. The range was from less than 36 to 24,000. That is the range we were talking about, which gave a median value of 930.

In Nut Island we had a range of less than 36 to 2,400, and a median value of 73.

MR. QUARLES: What I am really, I guess, leading up to is wondering whether in your judgment we are at all close to being able to see some substantial sections of the harbor opened up to what I would call individual citizen recreational harvesting.

MR. COLLINS: I think I should point out that we are talking, say, in Massachusetts, about some 40,000 acres. And within, say, 15 or 20 minutes of Boston Harbor there are many free, open areas. I think that is one factor that should be established.

I said some of these are becoming marginally close to open areas. We would want to see a continuing performance here -- we would recommend this -- and make sure we have a continuing operation as has been conducted by the MDC.

Of course, you will notice I have addressed myself to the harbor beaches and to midway in the harbor. I am sure if we get into some of the inner points of the harbor close to outfalls we will show higher figures. We were looking at the effects of the two treatment plants and in close to the Dorchester Bay beaches.

MR. STEIN: What this suggests to me, Mr. Collins, is if we are this close to a provisional operation -- this is the way I see it now -- and if you are really close to the 70 coliforms per 100 ml, it is only available provisionally to commercial fishermen who can have the advantage of depuration. Now it doesn't seem to me that we have much farther to go to push it over the line.

However, we have two ways to go at it. If we put increasingly more subdivisions and more people on these lines and get the waste to the same source that put the chlorine in, we are not likely to go below it. That is one thing. Or if we -- and this is the same thing

I talked to Mr. Sears about -- go to secondary treatment and have chlorination -- and we all know that disinfection is much more effective with secondary than primary -- we would be, no doubt, in position to drop way below.

So we have two avenues of attack. The point is possibly as the population increases to have the same kind of primary treatment plus chlorination and try to get this down -- because the only way to go is up if you have more of a load there -- or perhaps increase the treatment.

It seems to me in light of what Mr. Brownell said, if you are going to pick up the 26 islands and if you are going to open this as a tremendous recreation area -- and I don't want to put this out as just on shellfish alone -- but certainly people can harvest the shellfish and take them home.

Secondly, I know that if they are going to use this for water contact sports and if you have 1,000 coliforms in the sea -- some people in the swimming pools on the west coast, and I suspect you might have it here have 240 -- the lower we can get those coliforms and the lower we can get the pathogens, if we are talking about Boston Harbor as a recreation area, I think we have a great thing.

I am very impressed with Boston, Mr. Collins. One of the delights of Boston is your rapid transit system and the way the people can get around. I think you have one of the --

MR. COLLINS: Well, --

MR. STEIN: I don't know. You people live with it every day. But I go around the country, and I think it's one of the best.

I was brought up in New York and could get on the subway as a kid for a nickel and go around.

But this question of having a clear area within 15 or 20 or 30 minutes outside the rapid transit system doesn't really help the people who drop a quarter in that slot and get somewhere.

I think we have a tremendous opportunity here to clean up the waters of Boston Harbor. You are so close. And we have an opportunity to get these set for a maximum recreational unit.

Given the coliform counts that you have, as you put it, you are down to the area where the people who are professionals in the field -- where we have got a marginal shake. The difficulty is I don't want to see that getting worse. The more stuff you are going to put in these plants and the more you are going to try to chlorinate it, the more you are going to shape each year whether you are above the limit or below the limit. With a little extra effort it seems to me, or planning, you may get so far below the limit that we can all sign off on it and open the harbor.

MR. COLLINS: I'd say, yes, we are marginally close to it. There is a question what direction we might take. I know when certain samplings were taken -- Commissioner Brownell was on some of the islands -- they are now within bathing quality guides.

Our guides are I'd say perhaps as rigorous as any. As I say, we only use the coliform as a guide. We prohibit any direct discharges of sewage. Or an epidemiological study showing any problem here. So it is only a guide.

It is rather interesting. For bathing we can't just aim at a number. For example, in England they call the "golden beach" their better beach. It has a value of not greater than 50,000 coliforms. In Japan I think they talk about half a million. So it's relative.

But we have a pretty strict guide, but it's not just the bacterial count. And we're there now with most of our harbor islands.

I say it's a marginal approach. Certainly the interceptor system, the outfalls -- and this is something we are all agreed on here should be the first approach -- that if we are marginally close with chlorination and we prevent intrusion of salt water, we improve the existing operation of our primary treatment plants. We haven't really explored that fully.

So I would agree with what was said earlier on secondary treatment. The cost of this may be precipitous at this time. We are awfully close now, and there are some arguable points on the validity of secondary treatment into tidal estuaries, I think you are well aware.

The primary point here was to diminish the oxygen uptake which is of no significance here in tidal estuaries. In inland waters, yes. But we are certainly vitally concerned with the bacterial content of this, and, as I say, our figures show a dramatic improvement.

MR. QUARLES: Are there any other questions?

MR. PAHREN: I have a question. First of all, a comment. I am glad to see that the recommendation that came out of the April 1969 enforcement conference for the immediate installation of additional chlorination capacities is paying dividends.

MR. COLLINS: We are too. It wasn't too popular at the time.

MR. PAHREN: On the data that you present for the Deer Island outfall, you indicate they are random samples, and I assume that some of these figures are for the outgoing tide when they were getting the sludge --

MR. COLLINS: Some of these are under all conditions, ingoing, outgoing, yes.

MR. PAHREN: So perhaps it is safe to assume that some of the higher figures include the sludge --

MR. COLLINS: It could very well be such.

MR. PAHREN: Okay.

MR. COLLINS: That is right.

MR. PAHREN: One other thing. Would you like to comment on Mr. King's earlier statement about the burning of the debris across the 3-mile limit from the Department of Public Health standpoint?

MR. COLLINS: Yes. With these outside our territorial limits, I'd like to know what you're doing about it. Actually, we have come to a standstill. We have no control.

MR. PAHREN: The United States has a 3-mile limit, but I think Massachusetts sometimes wants to go 120, so --

MR. COLLINS: Yes. Well, I think they settled on a 3-mile limit. In fact, I think they have established between head lines in some areas-- In Kupman Bay area it is 10 miles. It depends how you approach it. They are burning I think presently off of Beverly, out of the 3-mile-limit direct coastline -- have taken the bay area out beyond 11 miles. In fact, I think they have been burning right along the line there where the Coast Guard doesn't quite know whether they are in or out. We have no jurisdiction. That's very clear.

MR. PAHREN: You do get complaints though? Is this correct?

MR. COLLINS: We do have complaints, and we did via our own air pollution regulations give criteria to the Department of Public Works which would specify there would only be clean material burned out there, strictly clean material, only demolition material, until such time as we had other ways to alleviate the problem.

Remember, going back particularly with a lot of rehab going on in Boston, the burnings were being carried out in Boston proper. There was a better approach. You had to provide relief out here, and this was the relief.

But it is specified they shall only burn clean material, and it should only be burned under certain pre-forecast meteorological conditions.

MR. PAHREN: I have no further questions.

MR. QUARLES: Mr. Newman, of the New England River Basins Commission.

MR. NEWMAN: Mr. Collins, I was wondering if you would comment about the metals content relative to shellfish. In other words, Mr. McLeod has indicated they have carried out some studies, and I was wondering whether you are concerned particularly about the metals level and metals level in shellfish.

MR. COLLINS: Yes. Actually, about a year ago I think they were the first ones in the country to pick up levels in shellfish. Unfortunately, this is down in the cape area where there is a pristine pure area, and it really threw us for a ringer at the time.

This time we joined forces with Commissioner Brownell, Division of Water Pollution Control, and we went into a concentrated program where we did survey all of the shellfish harbors and areas along the coast, which resulted in two closures, only two closures. In the others we found mercury content safe and within limits.

Now there were certain restricted areas or closed areas of shellfish, forbidden to the taking of shellfish, that we haven't looked at, very few areas that we haven't looked at. And in some of these we did find high, prohibitive levels, but these have been closed because of bacterial contamination. But all areas open we have surveyed and are safe.

MR. NEWMAN: So that the Boston Harbor shellfish situation as far as having --

MR. COLLINS: Boston Harbor open areas allowed for digging are safe, yes. In fact, I think we did some 700 analyses within a short period of time.

MR. QUARLES: Are there any further questions?

(No response.)

Mr. Collins, we thank you very much for that presentation.

MR. COLLINS: Thank you.

MR. QUARLES: We are going to take a brief recess now. It is about 3:15. We will reconvene at 3:30.

(Whereupon, a recess was taken.)

MR. QUARLES: If you would take your seats, we would like to reconvene.

Mr. McMahon or Mr. Brownell, would you please continue?

MR. BROWNELL: Thank you, Mr. Chairman.

The person I would like to call upon now is Mr. Joseph F. Casazza, Commissioner of the Department of Public Works of the city of Boston.

Mr. Casazza.

STATEMENT OF

JOSEPH F. CASAZZA

COMMISSIONER OF PUBLIC WORKS

CITY OF BOSTON, MASSACHUSETTS

MR. CASAZZA: Mr. Brownell, Mr. Chairman, gentlemen, I would like to make an extremely brief statement on the problem at hand.

As sometimes happens in a meeting like this, you end up with the individual philosophy type thing. But what I am briefly about to state is what I honestly believe. And I believe that the biggest challenge facing the EPA, the Commonwealth in this case, and the local governments is the basic fact that we find it very difficult-- In fact, nobody in their right mind would talk against any of the pollution problems, solid waste problems, what have you, that face us all, but what we sometimes forget is that the public that has been referred to this morning -- and I don't believe that I agree with it at all -- get put into the category of being apathetic, "care less."

It isn't really saying that. What they are saying is the same thing that each and every one of us is saying when we buy anything. In any decision that we ever make, whether it's to buy a suit of clothes, an automobile, or a home, or what have you, eventually the question comes up of how much and is the money being well spent?

So I guess briefly what I am trying to say is that the problem we have facing us is that we have a multiplicity of problems in a meeting such as this one here today, and the attention is focused on a particular phase. So I would say that at a Federal, State, and local level, our new secretaries in the reorganized State government, those of us in the municipal level, and what have you, we have to address ourselves to the problem of how much.

I think it was interesting this morning even in these hearings how we started to see the overlap of cleaning up our waters and, if you will, burning and air. I think many, many times-- Just yesterday I sent people over to the State Department of Public Health in regard to air pollution problems in the city of Boston and in particular to an incinerator under my control.

I think the time has come, very frankly, when we have to start to evaluate what we have achieved. I think it has been expressed here a couple of times. I don't think the fact that there is cooperation between

Federal, State, and local agencies is a commitment on anybody's part. That's our job. That's what we have to do. And that's going to continue.

But I think that the realistic evaluation of what we have bought and how much in the face of these other problems-- Nobody can argue with the goals. We are all shooting for goals. But by definition of job title or agency or whatever the case may be, you find that there are purpose-oriented agencies and individuals, and rightly so, but my plea is to those who would be the goal-oriented people to listen to the various pleas of the multiplicity of problems and start to address themselves to priorities in what all of us who pay the burden can afford.

Now, in this regard I would ask the Federal agencies something, for example. I find a paradox in the statement I think made earlier here today, but if not made earlier here today in general, when I go down to Washington to talk about solving some of Boston's problems in cooperation with any of the agencies here today we mention two phrases in the same statement that don't seem to make any sense to me.

One, we talk about the antiquated system, which is a fact of life, and in the same case we talk about the new, upgraded standards that we must meet in 1971.

Now, I'm all for them, but I think there is another way to get there. I think what we have is a confused public. Because you know the old story. You talk to somebody about $5,000 and you have got their attention. When you talk three-quarters of a billion dollars, you lose them. I think this is one of the things that we have done, all of us.

I think of the magnitude, if you will, for example, of the Camp, Dresser & McKee report funded by HUD which directed a regional approach, if you will, toward a solution. But at the same time, obviously, for the city of Boston, being the core city and the city for which the report was made, as I stand here today, that three-quarters of a billion dollar study or implementation on a so-called deep route tunnel plan is not eligible for one penny of Federal funds.

I think as long as you have those things staring you in the face you have a difficult time in achieving the goals. Yet the individual purposes along the line are understood.

I find no animosity built up within myself to the agencies that I do business with in trying to pull this thing together, understanding what their particular purpose is and the fact that they are working under the guidelines as established from above, if you will, wherever that may be.

But that is the feeling I have. I think that the treatment of the Federal Government of combined overflows and an antiquated system for old cities, most certainly Boston, Massachusetts included, has to change.

I think on the talk of the secondary treatment it is again very, very difficult to argue against its value, but at the same time how much, gentlemen?

So in the other regard I think what I would like to address myself to is the fact that, sure, there is cooperation among the agencies. Commissioner Sears made a couple of statements this morning that I just feel for the benefit of the committee and their record I should clarify. Regarding the delay, if you will, in implementing the tidegate repair program, I would just briefly state, because I don't feel this is the time or place for any picayune debate type thing, that most certainly I believe, if I remember correctly -- I was listening in the audience -- the delay most certainly wasn't because the city of Boston wouldn't sign a paper to allow MDC to enter upon its property.

I would just as soon leave it there -- that that was not a correct statement. If you want edification, I would be glad to give it.

The other thing is a joint venture along the line we were talking about. In 1969 I believe it was the MDC did propose a program to construct a chlorination and detention tank adjacent to the Calf Pasture pumping station near where the new Massachusetts campus is going in, and at that time the city of Boston proposed that we thought the implementation of one section of this report that I made reference to earlier, the federally-funded Boston main drainage report, was a much better way to go.

In that regard we were not in favor of the MDC legislation. However, it did pass. But the MDC working with their engineers and commissioners did agree and do agree I believe that the so-called Boston plan, if you will -- but I would rather call it a joint venture -- was the way to go.

And as Commissioner Sears did express, that program has had difficulty in getting the proper recognition at the legislature.

But I did want to make a point that that program was proposed by Boston, adopted by-- And we'll be glad to continue to work with the MDC on it. As I stand here today, I have the money. And it was difficult inasmuch as when I went to get the funds to fund our portion of I believe a $30 million project -- I think we are in there for some $12 million and of the remaining portion Boston pays a pretty large chunk through the MDC assessment -- in order to get those funds we tried very diligently to see if we could find out what was eligible and what wasn't eligible.

Because the report, the 1968 report, has a lot of asterisks in it -- that at the time it may be eligible for Federal funds. And I know that Mr. McMahon made sincere and constant inquiries of the Federal Government to find out what the present thinking was on eligibility.

I had to go get that money not knowing just exactly what the answer was. And it most certainly wasn't his fault.

So that is briefly to set the record straight on those things. And I really and truly feel that the purpose-oriented organizations versus the goal-oriented-- I think that there is a heck of a challenge on our secretaries in the Commonwealth. I think you fellows have an awful problem -- leaving this meeting and then going and sitting down next to somebody who has had the same type of meeting on air and somebody else talking about this and somebody else talking about something else.

Somebody up there has got to start pointing the finger and saying, "With the future dollars we have this is where we are going."

Thank you, gentlemen.

MR. QUARLES: Are there any questions?

MR. PAHREN: No questions.

MR. BROWNELL: No questions.

MR. QUARLES: Mr. Casazza, we thank you for that statement. It is helpful to have your comments.

Mr. Brownell.

MR. BROWNELL: Mr. Chairman, I would like to call now upon Mr. Thomas P. Callaghan, Chairman of the Boston Harbor Pollution Committee.

STATEMENT OF
THOMAS P. CALLAGHAN
CHAIRMAN, BOSTON HARBOR POLLUTION COMMITTEE
BOSTON, MASSACHUSETTS

MR. CALLAGHAN: Mr. Chairman and gentlemen, my name is Thomas P. Callaghan. I am Assistant to the Executive Director of the Massachusetts Port Authority, and I am the Chairman of the Boston Harbor Pollution Committee which is sponsored by the Authority without having any undue influence over it.

Thomas P. Callaghan

The Boston Harbor Pollution Committee is a voluntary association with about 25 representatives of Federal, State and local government, together with private interests.

I believe, because it is late in the day, I should leave this statement with you and just summarize my comments by saying that one of the most important things I think that any voluntary association of this type can do is to affirmatively seek legislation and negatively oppose legislation which we feel is detrimental to the harbor. We have been, I think, quite successful.

Our organization was the primary influence behind the passage of Chapter 878 of 1970 which provides for the ripping out of dilapidated piers. And I trust that if we do have a single transportation trust fund we don't lose that particular benefit for the water user.

I believe that Mr. King of the State Department of Public Works has told you something of the bill. I would like to add-- Or perhaps I had better summarize the bill.

The bill provides that an additional one-fifth of 1 percent of the gasoline tax be assigned for the benefit of water users inasmuch as over a 2-year period the Boston Harbor Pollution Committee convinced the legislature that this was a logical proportion of the gasoline tax which wasn't rebated to the water user and which should go for his benefit.

So that that amount of money, which is $700,000 to $800,000 annually, is being used to fund the ripping out of dilapidated piers, dredging in the harbors and the streams of the Commonwealth, together with some weed control in ponds in various parts of the Commonwealth.

One of the benefits of this particular type of legislation which certainly should be of interest to anyone along the waterfront is that if a pier owner goes through a court case and loses his position -- that is, if he is found to be maintaining a nuisance -- then the State Department of Public Works can come in under action by the Attorney General, rip out the dilapidated pier, and assess the cost through a lien on the upland.

Now, if the owner decides that he doesn't really want to discharge this lien, then the piece of shore property becomes available for a pocket park or things of that nature.

I think that is one of the great benefits of the bill. So instead of looking at dilapidated piers, we may be looking at some attractive parks.

This year we were successful in having enacted Chapter 44 of the Acts of 1971 which provides for a Boston Harbor Pollution Abatement and Waterfront Development Commission. That is a pretty broad scope of objective. But the general idea is to have Boston Harbor given the energizing influence of a commission similar to the San Francisco Bay Conservation and Development Commission.

With 45 miles of water out there and I think about three police officers on the usual shift and a few Coast Guard people, there certainly seems to be a necessity for a comprehensive program governing that 45 square miles of water.

I believe that the rest of the information on the work of the Boston Harbor Pollution Committee is in the statement. I just did want to focus on those aspects.

(The prepared statement of Mr. Callaghan follows.)

PREPARED STATEMENT OF THOMAS P. CALLAGHAN

The Boston Harbor Pollution Committee, sponsored by the Massachusetts Port Authority, has shown the effectiveness of a voluntary association in organizing and coordinating the efforts of more than two dozen organizations to improve pollution abatement in Boston Harbor. The committee meets monthly at the Massachusetts Port Authority and includes in its membership Federal, State, and municipal agencies as well as civic groups such as the League of Women Voters, Sierra Club, and the Maritime Association of Greater Boston.

Over the course of the last 7 years the Boston Harbor Pollution Committee has developed effective cooperation among the widely scattered responsibilities of city, State, and Federal agencies. At the same time it has integrated the efforts of private corporations and civic groups through discussions and action programs.

In 1970, the Boston Harbor Pollution Committee was the chief supporter of legislation which became Chapter 878 of the Acts of 1970 and authorized the expenditure of approximately $800,000 of gasoline tax funds annually for pollution abatement purposes. These funds will permit the removal of dilapidated piers which have been eyesores in Boston Harbor for decades, as well as underwrite various forms of cleanup in the harbors and streams of the Commonwealth.

Although the Massachusetts Port Authority has no statutory responsibility for the abatement of harbor pollution, it has requested that the first efforts to remove dilapidated piers be in East Boston. Already, notices have been sent to a dozen owners of broken-down piers in East Boston under the authority vested in the State Department of Public Works under Chapter 878. These owners will be asked to remove the piers within a reasonable length of time. If satisfactory action is not taken, the Attorney General is authorized to take legal action. If the State has to remove the piers, a lien is taken on the upland associated with the pier.

This year the Boston Harbor Pollution Committee supported State legislation which has become Chapter 44 of the Resolves of 1971 and provides for a special commission to study water pollution in Boston Harbor and the redevelopment of the Boston Harbor waterfront.

"Said Commission shall consider sources of Boston Harbor pollution, the implementation of a program of pollution abatement, and the redevelopment of waterfront land in keeping with the assessment that the harbor is the most valuable single natural resource of the

Commonwealth. Said Commission shall coordinate its effort with the Department of Natural Resources which is developing a conservation and recreation program for the islands of Boston Harbor."

This legislation is similar to the study which resulted in the San Francisco Bay Plan and the creation of the San Francisco Bay Conservation and Development Commission. The west coast commission studied in comprehensive fashion not only the needs of fish and wildlife, recreation. conservation, and boating, but the economic needs of port facilities and other commercial interests.

Recently, more than 25 members of the Boston Harbor Pollution Committee made a survey of the harbor and found that conditions had improved greatly. A newspaper report stated: "The Committee found conditions in the inner harbor vastly improved from previous years, especially in Chelsea Creek, which was free of oil slicks from its many terminal operations. There was also an absence of floating debris that has been a hazard in the past."

The Massachusetts Port Authority in its annual congressional liaison meeting with the Massachusetts congressmen urged that funds be provided in this year's Federal budget to complete the $110,000 study of hazardous debris which was sponsored by Senator Kennedy and executed by the Corps of Engineers. Heavy timbers floating in the harbor have been hit by small boats with resultant damage running into thousands of dollars, as well as endangering lives. At present, the Corps of Engineers expends approximately $20,000 annually to contract for the pickup of floating debris in the harbor.

The harbor cruise, sponsored by the Coast Guard, which is a member of the Boston Harbor Pollution Committee, inspected the northwest shore of Long Island where the committee had organized a cleanup of over 300 tons of debris last summer. More than 400 persons were organized for this cleanup with the cooperation of the Sierra Club, Massachusetts Audubon Society. Ranging in age from 7 to 70, the volunteers worked in 95-degree temperature on two weekends to prepare the beach as part of a new recreational area.

This year the Massachusetts Port Authority donated funds for an educational program to enlist citizens in the reporting of polluters. Posters have been placed in yacht clubs and other waterfront facilities asking that citizens "Keep Boston Harbor and its waterways clean. Report polluters promptly. Telephone 727-3905."

The calls are received by the Marine and

Recreation Division of the Registry of Motor Vehicles, which is represented on the Harbor Pollution Committee. The telephoned reports are relayed to the appropriate agency for action.

Executive Director Edward J. King of the Massachusetts Port Authority praised the work of the Committee and indicated that one of the most effective ways of continuing to improve the quality of harbor water is by strict law enforcement.

Actually, numerous Federal and State anti-pollution laws have been in existence for many years, but effective enforcement is just beginning. Some idea of the enforcement problem may be gained by the realization that there are approximately 200 miles of waterfront in Boston Harbor and that the water area is approximately 45 square miles. This area is equivalent to the entire land area of the city.

Much of the improvement over the course of the last 7 years has come from the cooperation of waterfront interests, particularly oil companies, and from the coordinated action of agencies represented on the Committee. The location of pollution discharges has been mapped and a comprehensive program of permits, controls, and capital improvements established by cooperation of Federal, State, and local agencies.

This year the citizen is being asked to do his share by reporting violations of pollution abatement laws.

- - -

MR. QUARLES: Thank you, Mr. Callaghan.

Are there any questions or comments from the panel?

(No response.)

Thank you very much.

Mr. Brownell.

MR. BROWNELL: Mr. Chairman, I would like to call now upon Mr. Thomas C. McMahon, Director of the Division of Water Pollution Control, water Resources Commission, Department of Natural Resources of the Commonwealth.

STATEMENT OF
THOMAS C. McMAHON
DIRECTOR, DIVISION OF WATER POLLUTION CONTROL
WATER RESOURCES COMMISSION
BOSTON, MASSACHUSETTS

MR. McMAHON: Mr. Chairman, fellow conferees, members of the conference, I do have roughly a seven-page statement. If you have no objections, I will cut it down as long as it can go into the record in total.

MR. QUARLES: We certainly will include it in the record completely. Proceed however you wish.

MR. McMAHON: Thank you, Mr. Chairman.

Mr. Chairman, my name is Thomas C. McMahon, Director of Water Pollution Control, under the Massachusetts Water Resources Commission, in the Department of Natural Resources.

Our agency was created under Chapter 685 of the Acts of 1966 with the responsibility to enhance the quality and value of the water resources of the Commonwealth and to establish a program for the prevention, control, and abatement of water pollution.

Three companion pieces of legislation provided for a State bond issue of $150 million to assist cities, towns, and districts in the construction of waste treatment facilities and two tax-inducement provisions for industries constructing their own treatment works.

Succeeding legislation to date includes an additional $250 million bond issue for construction grants, including prefinancing of the Federal share in anticipation of Federal reimbursements, stringent oil pollution laws incorporating emergency cleanup funds, mandatory waste treatment plant operator certification, boat pollution and marina control authority, an ocean disposal law, and streamlined administrative enforcement capabilities. These bills were signed into law during the 1970 legislative session.

Presently, there are some 630 significant pollution sources in the Commonwealth which are on an implementation schedule for construction of wastewater treatment facilities. These include 160 communities, 449 industries, 10 districts, and 11 miscellaneous sources. A total of 303 orders and consent orders have been issued to industrial firms and communities that have not met reasonable deadlines, and it is anticipated that this number will increase substantially in the next several years.

Programs for the training and retraining of wastewater treatment plant operators have been advanced by training courses at several locations and by the 22 research and demonstration projects which are now underway pertaining to State-oriented water pollution problems. Surveillance of water quality and treatment plant efficiencies are evaluated by sampling programs, automatic water quality monitoring stations, and comprehensive stream studies.

It should be noted that some 70 State construction and final planning grants have been made to municipalities since 1968 representing approximately $200 million worth of waste treatment plant construction. Construction of major projects in Lowell, Haverhill, the Greater Lawrence Sanitary District, the Upper Blackstone Water Pollution Abatement District, the South Essex Sewerage District, Springfield, Chicopee, and Holyoke in the next several years should reflect a marked improvement in the quality of Massachusetts waters. These projects vary from $10 million to $60 million and total nearly $400 million in cost. Clearly, increased Federal financial aid is necessary to ensure culmination of this program.

Contrary to normally expressed opinions, industry in Massachusetts is doing a creditable job with their industrial waste problems. Of 449 industries on an implementation program, some 203 industries have satisfactorily completed their program, and the remaining are in various engineering stages of compliance or are involved in litigation with this division.

In summary, the major organizational and functional components of a comprehensive and far-reaching water pollution program for the Commonwealth of Massachusetts have been established.

The problems of Boston Harbor and tributary water sources have been enumerated in the joint report, and background levels of quality have been established in the harbor area. The resultant technical data indicates that with the exception of the inner harbor the water quality in Boston Harbor meets the State's criteria in 10 out of 11 parameters.

Boston Harbor receives untreated and treated sewage discharges, combined sewer discharges, debris, oil, and wastes from pleasure and commercial craft. Each of these categories of wastes is being attacked by ongoing programs at the State and/or Federal level with the exception of the combined sewer problem, which presently does not lend itself to any reasonable technical or economic solution.

To indicate the concern of our agency, approximately one-half of the 32 research and demonstration projects funded in the past 3 years have direct relevance to Boston Harbor problems. Some of these are as follows:

	TITLE	INVESTIGATOR
1.	Environmental Monitoring of Boston Harbor	New England Aquarium
2.	Control of Contaminated Stormwater by Use of Sodium Hypochlorite at Wollaston Beach	SEA Consultants

TITLE	INVESTIGATOR
3. Use of Organic Polymers to Improve Primary Setting	Calgon Corporation
4. Time-Variable Mathematical Water Quality and Hydrodynamic Simulation Model of Boston Harbor	Hydroscience, Inc.
5. Charles River Study	Process Research Incorporated
6. Oil-Boom Harvester System	JBF Scientific Corporation
7. Water Quality Improvement Study of Tenean and Malibu Beaches	Camp, Dresser and McKee
8. Photographic Analysis of Boston Harbor	Itek Corporation
9. Oil Pollution Control in the Town-Fore River Area	A. D. Little, Inc.
10. Oil Control Barrier Chelsea Creek	Quincy Adams Marine Basin, Inc.

We had a report under research and demonstration grant prepared for the Division of Water Pollution Control by the firm of Hydroscience, Inc., of Westwood, New Jersey. This was done over a 2-year period and specifically to give the State some answers insofar as what directions to proceed as far as water quality improvements in the Boston Harbor area. The report was published in July.

We had a meeting last week, at which time a number of people attended, including the Environmental

Protection Agency.

The results of the Hydroscience, Inc. development of a mathematical model for Boston Harbor has proven a most valuable tool in evaluation of the current and dispersion characteristics of the harbor providing a mathematical model to measure and evaluate future engineering projects in the harbor area. But three of the most significant conclusions of the report I would like to enumerate:

1. There has been a significant improvement in harbor water quality due to increased chlorination practices at the Deer Island and Nut Island treatment facilities.

2. There is not a need for additional treatment at Deer Island or Nut Island through the projected year of 2020.

3. There should be evaluated alternate methods of sludge disposal at these facilities in order to meet water quality standards.

This has been discussed this morning. This presently is being done under the memorandum of agreement between the Metropolitan District Commission and the Division of Water Pollution Control.

Since the fulfillment of the original memorandum of agreement between the Metropolitan District Commission and this Division, a further agreement was signed on October 21, 1971, which I have furnished to the conference for the conference record.

A conference of this type can be beneficial only if identifiable programs recommended for water quality improvements are made realistic and achievable. Presently, this is not the situation in the Boston inner harbor and tributary streams where mixed stormwater and sewage constitute the major water pollution problem.

As the combined sewer problem plagues virtually all older metropolitan areas of the United States, it would seem apparent that new Federal legislation -- and the Environmental Protection Agency -- should direct itself to this problem with a Federal financial assistance program to solve this problem by separation, detention, and chlorination or new and improved alternative methods.

A further disillusionment to State and local officials is the complete lack of program correlation at the Federal level. Enforcement procedures and dates do not conform with the availability of funds for treatment plant construction even though everyone recognizes that the pace of construction is inexorably tied to Federal financing.

Approved State water quality standards are presently ignored by the secondary treatment regulation (Federal Register Vol. 36, No. 134 - Tuesday, July 13, 1971) requiring secondary treatment as a prerequisite for Federal construction grants unless discharges are to open ocean waters. This policy requirement is at complete odds with the intent and wording of the Federal Water Quality Standards Act of 1965 and promotes not only a lack of confidence in Federal policy decision making but a tremendous financial impact on the Metropolitan District Commission and its 42 member communities.

A list of planned projects in the Metropolitan District Commission area affected by this decision is as follows:

	Est. Project Cost
Boston - Main Interceptor	$ 10,860,000
Dorchester Brook Connection	370,000
Columbia Point to Columbus Park	1,070,000
East Side Interceptor - I	5,932,000
East Side Interceptor - II	11,300,000
Wakefield - Force Main	1,000,000
Weston - Pumping Station Force Main	1,200,000
Holbrook - Interceptor	1,000,000
Wilmington - Interceptor	3,000,000
Wellesley - Pumping Station Force Main to Newton	700,000
MDC - Quincy - Montclair P.S.	650,000
West Roxbury - Brookline-Newton Int.	2,250,000
Reading Interceptor	2,500,000
Melrose - Stoneham Int.	1,000,000
Reading P.S.	100,000
Tenean Beach Int.	10,000,000
TOTAL	$ 52,932,000

In conclusion, Massachusetts has a commitment to clean water and to support programs that will attain this goal. It should be apparent today that this concept does not end with the regulatory agency but is incorporated in action programs by the Metropolitan District Commission, other State agencies, and local government. The fact remains that without a Federal commitment to the fair share of the cost of cleanup efforts, including combined sewer discharges, our goals will not be attainable.

I would further suggest that the Environmental Protection Agency consolidate and streamline the Federal water pollution control enforcement and administrative activities to reduce duplication and increase effective Federal and State cooperation.

Continuing just a little bit as far as priorities are concerned in Boston Harbor -- this is something I don't think the conference really has addressed itself to -- I think we have made the point reasonably clearly that as far as secondary treatment is concerned, this would have to be a fairly low priority item in the face of other serious problems within the harbor.

I think Mr. Collins in his presentation made it quite clear that as far as the bacterial contamination of shellfish areas, this was not a result from the discharge of either the Nut Island or Deer Island sewage treatment plants. The dissolved oxygen in the area of the Deer Island and Nut Island treatment plants is high.

Again, Hydroscience indicates that it will be the year 2020 basically before secondary treatment is needed.

The biggest besetting problem confronting the Boston Harbor area is solving the combined sewer discharge problem, and I hate to see us getting off the track and not coming up with programs that are basically going to solve the problem.

We can talk about these other things. And I agree alternative methods of sludge disposal are needed. There is no question about it. As far as the effectiveness of chlorination, the effectiveness of chlorination will be improved by alternative methods of sludge disposal. As far as going to secondary treatment and making more effective chlorination, this is no reason whatsoever to go to secondary treatment.

So if we can go basically on a priority system, the No. 1 priority has to be the proper solving of the combined sewer problem in the area. Sludge disposal, yes; this is important. The rehabilitation of tidegates; a big issue was made of this today. This is not treatment. What this does is to reduce the amount of infiltration into the Bostor main drainage system which has to receive treatment at the Deer Island and Nut Island treatment plants.

The fact remains this is not accomplishing any particular water quality goals over and above increasing the capacity of our interceptors.

There is roughly $115 million worth of work that should be done by the city of Boston and the MDC right within the confines of the city of Boston. These projects will have a material impact in improving water quality contiguous to bathing beaches and to shellfish areas. Secondary treatment at Deer Island and Nut Island will not do this.

Thirdly, another higher priority item -- and this is put together again in the memorandum of agreement -- is the enforcement of the sewer regulations within the 42 cities and towns within the Metropolitan District Commission. I consider this considerably more important on a high priority item.

Lest one think I am not interested in secondary treatment, we have quite an interest in secondary treatment. It is the policy of our division to require secondary treatment on all of the freshwater treatment facilities and its equivalent as far as industrial wastes within the Commonwealth. On coastal areas our requirement is the degree of treatment necessary to meet the water quality standards.

Our point here is that on a priority basis we do not believe that secondary treatment at this time is anywhere near as important as many of the other things that I have outlined.

I would like to say a few things about money.

Presently, there is a continuing resolution as far as the Federal Government is concerned. People are talking about secondary treatment at $40 and $50 million. If the new program should go through, I suspect that Massachusetts would get roughly in the neighborhood of $50 to $55 million to be used for construction grants. We could wipe this out in one project.

There is no particular emphasis at the present time in Congress to continue the reimbursable features of the act. We have harped on this, mainly because we feel that we will have roughly $200 million worth of work in this fiscal year that could actually -- money that could be obligated and under construction within a reasonable period of time. So that again we're throwing in another input of $40 or $50 million for what I would consider a very low priority in contrast to the treatment plants that we would need in Springfield, in Lowell, and in Lawrence, at the South Essex Sewerage District, because of a regulation and because of basically a policy decision that you should have treatment for treatment's sake.

I think that this is incorrect. I don't think it's based on good engineering judgment. And, frankly, I think our priorities are completely out of kilter. And in that respect I would go along with what

Mr. Casazza from the city of Boston said.

MR. QUARLES: I think I have already indicated -- but I will say it once again so there will be no question in your mind or anyone else's -- that at least as far as I am concerned this question of secondary treatment is one which presents itself with urgency mainly in the sense of requiring consideration.

I don't have a clear preconsidered judgment in my own mind as to its need here, although I have indicated my personal hunch on the subject. Certainly the comments that you are making address other very important relevant considerations that have to be taken into account as to need and as to priority. This is something we are continuously faced with, and you are too, as to balancing relative priorities and conflicting considerations to try to come out with the determination and the judgment that will best serve the public interest by giving proper reflection of all of the factors that are involved.

Are there questions? Mr. Pahren or Mr. Brownell?

MR. BROWNELL: No, Mr. Chairman.

MR. QUARLES: Mr. McMahon, we thank you for that statement.

Mr. Brownell.

MR. BROWNELL: Mr. Chairman, the next person

I would like to call upon is Mr. Walter Newman, Senior Staff Associate of the New England River Basins Commission.

STATEMENT OF
WALTER NEWMAN
SENIOR STAFF ASSOCIATE
NEW ENGLAND RIVER BASINS COMMISSION
BOSTON, MASSACHUSETTS

MR. NEWMAN: Mr. Chairman, ladies and gentlemen, I am Walter Newman, Senior Staff Associate of the New England River Basins Commission, representing Frank Gregg, Chairman of the Commission, who expresses his sincere regret at not being able to participate here today.

I am presenting this statement on behalf of the Commission's Boston Harbor Water Quality Management Coordinating Group.

I will make an abbreviated statement which will be extracted from the statement I have prepared here, but I would like the entire statement included in the record as if read.

At the enforcement conference convened on April 30, 1969, the conferees agreed that a comprehensive water quality management plan would be completed for the Boston Harbor drainage area under the leadership of the Massachusetts Division of Water Pollution Control and the

Federal Water Quality Administration (now EPA) with the New England River Basins Commission serving as a coordinating vehicle.

Following the enforcement conference, a Boston Harbor Water Quality Management Coordinating Group was established by the Commission. The Coordinating Group includes representatives of the Environmental Protection Agency, Massachusetts Division of Water Pollution Control, Metropolitan Area Planning Council, Metropolitan District Commission, City of Boston, and New England River Basins Commission. The group has been working towards the preparation of a plan. The members have been working together regularly and meeting monthly to coordinate activities since that time.

Although substantial progress and particularly coordination of activities has been achieved by the group, progress has been slower than anticipated because of the press of other activities of more urgent priority.

Nevertheless, a study plan has been completed and a progress report published in October 1970. An interim report on combined sewer overflows has recently been completed, and I should like to request this report be made an exhibit of the conference at this time.

Reports on wastes from ships and pleasure boats and oil and hazardous materials are nearing completion.

A water quality mathematical model of the harbor has been developed and is assisting in the decision-making process. A second more refined model is planned in cooperation with the Massachusetts Division of Water Pollution Control which will provide a better understanding of water quality behavior on nearshore areas.

The Metropolitan Area Planning Council is completing a study of wastewater facilities in the metropolitan area and is also preparing a land use and water quality goals analysis for the harbor.

The Coordinating Group has also attempted to respond to the needs for immediate action programs and has greatly improved the working coordination and exchange of information among the participating agencies.

The preliminary findings of the group clearly indicate that priority action toward achieving the water goals in the harbor should be directed at the control of combined sewer overflows.

Secondly, we believe that floating debris and petroleum products constitute a major water quality impairment in the harbor. We believe that a new program not now in effect must be implemented to remove on a regular basis the small quantities of oil, scum, and debris whose sources may be uncontrollable and which present a very visible deterrent to the enhancement of water quality in Boston Harbor.

We believe it should be noted that action toward implementation of many of the recommendations included in the conference report is already underway, and we view this conference as giving these actions additional impetus and priority.

Finally, we would like to reiterate that the task of achieving the water quality goals of Boston Harbor requires a substantial commitment by all levels of government -- Federal, State, and local -- as well as private industry, groups, and individuals. We wish to focus the attention of this conference on the need for providing the necessary public resources to achieve these goals.

An adequate solution to the combined sewer problems may well cost several hundred million dollars. Careful planning and analysis of possible ways of implementing this program are essential.

Many of the recommendations included in this conference report are dependent on action by the Governor and the legislature and mayors, selectmen, and city councils. Substantial financial resources are involved. As an example, the estimated capital cost of rehabilitating combined sewer regulators in the Boston main drainage system is $1 million. Annual costs of operation and maintenance of the regulators will exceed $35,000 annually. The probable estimated annual cost of implementing an alternative sludge disposal method may exceed $3.5 million. And the estimated annual cost of enforcing heavy metal discharge regulations will probably exceed $30,000 annually.

In summary, the Coordinating Group wishes to emphasize that an essential element for achieving clean water in the harbor is sincere public commitment and corresponding public allocation of resources.

Finally, we wish to request that the conferees consider modifying the date for completion of the comprehensive water quality management plan from June 1972 to June 1973 in order to facilitate the development and evaluation of alternatives in the context of manpower constraints placed on the planning effort.

Thank you.

MR. QUARLES: Mr. Newman, could you give a little further explanation with regard to the last request that you just made?

MR. NEWMAN: Yes. We originally had a date for completion of the water quality management plan of June 1972. The agencies who are participating in this planning effort are the Federal and State agencies that I mentioned who are members of the Coordinating Group, including EPA and the Massachusetts Division of Water Pollution Control, who are providing the bulk of the manpower to carry out this planning.

In the course of developing our planning activities there have been many priority pressures that have been placed on personnel both in the Federal and State agencies, and this has resulted in our request for a year's extension for completion of the comprehensive plan.

That is not to say that we will not continue -- I mean we intend to continue -- with the development and preparation of interim reports, as we have, regarding the combined sewer overflows, which were distributed prior to this meeting.

MR. QUARLES: Well, we are grateful to have the interim report on combined sewers. I haven't had a chance to give it serious consideration personally in order to evaluate the report. But at first glance it at least appears to be definitely a step down the path in the right direction.

What is the relationship between the overall planning effort which you are responsible for and the type of study which we discussed earlier with Mr. Sears of the Metropolitan District Commission which they are contemplating?

MR. NEWMAN: I think we are focusing our efforts primarily on the analysis of water quality rather than on the technical engineering solutions of implementing specific recommendations.

In other words, what we are trying to do is evaluate, if we shut off certain overflows or if certain overflows are diverted, what would be the effect on water quality? So that we are not getting involved in how the overflows might be deferred or diverted but are concentrating on the water quality impacts of taking alternative actions both in the harbor and on the receiving waters.

MR. QUARLES: Are the scope and depth of your study effort sufficient to enable you to reach judgments as to what is needed to meet the water quality requirements?

MR. NEWMAN: Yes. Of course, all of the work that we are doing is feeding in again from the Federal and State agencies, so that the work that the Massachusetts Division of Water Pollution Control is doing on modeling the harbor plus the model that the EPA has developed are parts of the total planning effort that the Commission is putting together.

I think the Commission itself really, as the intent of the conferees indicates, was to serve as a coordinating vehicle between the Federal, State, and local agencies in developing a water quality plan that was integrated between these levels of government.

I think that we are really finding this a very successful operation in that respect, in that we have a group meeting together monthly and working together on a continuing basis which includes the Federal agency, the State agency, the metropolitan regional agency, the Metropolitan District Commission, and the city of Boston, and we can pool our efforts as well as coordinate activities between the various levels of government.

MR. QUARLES: I am not entirely familiar with all the details of the method of operation of the New England River Basins Commission, and I think it may be helpful for the record to have a brief description by you of the way your study effort is funded and carried out. And also what I am primarily interested in is your indicating the cost of this study and how much effort is being required to complete it.

MR. NEWMAN: All of the funding for the work ongoing under this effort is coming through the normal appropriation channels. In other words, EPA is funding it out of their normal planning funds. The State Division of Water Pollution Control is funding it out of their usual operating funds. The Metropolitan Area Planning Council likewise, and the city of Boston.

So there are no additional funds being expended over and above the normal operating funds that have been allocated to the various agencies.

MR. QUARLES: Has your agency done overall planning to enable you to be familiar with the total amount of effort that is required to do it by the participating agencies?

MR. NEWMAN: Right. We have laid out a study plan prior to this effort, and we know generally what is required in terms of manpower that will be needed.

MR. QUARLES: You mean manpower and cost?

MR. NEWMAN: Yes.

MR. QUARLES: What is that cost?

MR. NEWMAN: Well, let me just say this. I think it is a very difficult thing to assess in terms of dollars and cents because of the way the funds are allocated by the various governmental agencies. In other words, what I am saying is that --

MR. QUARLES: Well, excuse me for interrupting, but without trying to push you too hard to do something that might not be possible for you to do, roughly do you have an impression of how many man-years of effort are required to achieve this?

MR NEWMAN: Well, I would say that it is requiring at least I'd say 10 man-years of effort on an annual basis. But I don't think that that represents anywhere nearly the amount of effort that is really going into it, because so much of it is coming out of ongoing programs.

I mean if you were to assess what the Massachusetts Division of Water Pollution Control is putting into its total Boston Harbor effort, which again is a contribution to this overall planning effort, I'm sure it probably goes to 20 man-years a year or something like that.

So I think maybe 10 man-years every year is probably what is needed to put the pieces together but does not necessarily reflect the active investigations that are ongoing and needed to complement that.

MR. QUARLES: I think that is helpful to give us some sense of the scope of the work on that particular project.

Are there other questions?

MR. McMAHON: Mr. Chairman, can I ask a question?

Excuse me.

MR. PAHREN: Just a comment for the record -- a "nitty gritty" thing. The chairman did not rule on Mr. Newman's request, one, to include his entire paper in the record and, secondly, whether he could put this report in as an exhibit.

MR. QUARLES: Thank you for calling that to my attention.

Off the record.

(Discussion off the record.)

MR. QUARLES: There is no objection to doing that. We will grant that request.

(The report of the New England River Basins Commission, Boston Harbor Coordinating Group, entitled "Interim Report on Combined Sewer Overflows in Boston Harbor," October 1971, is on file as an exhibit in the Washington, D. C. and Boston, Massachusetts offices of the Environmental Protection Agency.)

MR. McGLENNON: Walter, were you here when

John Sears was testifying this morning?

MR. NEWMAN: Yes, I was.

MR. McGLENNON: During that testimony there was some discussion of an engineering study of the future needs for treatment in Boston Harbor in order to meet the water quality standards, and in discussing this with Commissioner Sears there was a question as to whether the agencies involved with Boston Harbor should get together and try to discuss among themselves what the parameters of this study would be. Prior to the time of initiating such a study, they would still have to be funded by the General Court, conceivably not funded until the middle of the next year.

You are also doing a planning study of Boston Harbor, investigating what is required in Boston Harbor for an overall plan.

You have indicated that you could not complete this plan until what date?

MR. NEWMAN: June 1973.

MR. McGLENNON: You won't complete the plan until then?

MR. NEWMAN: Right.

MR. McGLENNON: Would it be your opinion that an engineering study should not be initiated until your plan is completed?

MR. NEWMAN: Well, I think this would depend on what the scope of the engineering study is going to cover. I think if you are talking about alternative methods of sludge disposal, alternative methods of sludge disposal can be investigated at the present time. If you are talking about the question of secondary treatment, I think that we have some initial answers already on that score, and I think that the completion of the models that are underway will indicate positively and completely whether or not in the future secondary treatment is required.

I can just say that the indication is, both from the Hydroscience model that Massachusetts Division of Water Pollution Control funded and from the model that EPA developed in cooperation with the group, that secondary treatment is not a priority item in terms of meeting the water quality goals of the harbor.

MR. PAHREN: This is based on evaluating DO only?

MR. NEWMAN: Right -- DO and coliform. So that again I think there is need for engineering studies particularly to determine whether or not, as an example, the metropolitan district system should be extended to outer areas such as the upper Charles River Basin. I think that the Metropolitan Area Planning Council is now completing a report on sewer facilities for the metropolitan area.

I think if we bring those questions together there probably could be some engineering evaluations carried out in terms of the hydraulics in the operation of the situation which may be beneficial.

But I think as far as the questions that might be answered by the engineering report, it depends on what the specific proposal was to begin with.

What I am saying basically is that I don't think you can give an engineering firm, particularly in terms of the amount of money that you are talking about, an open-ended thing and say, "Tell us what to do." I mean you are going to have to point the way and specifically orient them toward the course of action.

The engineering firms will tell you how to do something, and they will not usually be in a position to tell you what to do. So that if an engineering contract were let, they would have to go to the Massachusetts Division of Water Pollution Control as well as the Federal agencies and say, "What are the requirements for treatment that we are going to have in the harbor?"

MR. McGLENNON: Right. I guess what I am trying to do is the same thing the chairman was trying to do -- to see if there is any specific relationship between the planning study that you are currently working on and the engineering study that we discussed with Commissioner Sears this morning.

I got from your answer there is a little bit yes and a little bit no.

MR. NEWMAN: Well, I think it is the difference of focus. Our focus is primarily on the receiving waters, and the engineering studies are primarily on the facilities.

So that basically I think if an engineering contract is let the scope of the work will have to be very tightly written to indicate what the engineer should investigate and what he should not investigate. I think his orientation will be toward a configuration of treatment facilities, but in terms of the amount of money provided he is not obviously going to have to make a complete reevaluation of the water quality implications of carrying out alternative ways of treating wastes.

MR. QUARLES: Would I be correct in trying to summarize what you are saying by suggesting that your study is focusing on the water quality conditions and what needs to be done, whereas an engineering study would focus primarily on how to do it?

MR. NEWMAN: That is just exactly right.

MR. QUARLES: We are going to need to discuss this further. But I can't refrain from observing that it seems quite logical in a sense we should try to push ahead with your study to reach its completion as rapidly as possible, because it may be that that type of study will have some important impact on what would follow.

So we will have to take under consideration the last request you made in your opening remarks with regard to the time that ought to be allowed for completion of that study.

MR. NEWMAN: The other point is that I think our study will point the way for the engineering consultant as to what alternatives to consider as logical or feasible ones to be considered for more detailed engineering evaluation.

MR. QUARLES: Mr. Newman, we thank you very much for that presentation on behalf of the New England River Basins Commission.

Mr. Brownell.

MR. BROWNELL: Mr. Chairman, we have one more person we would like to call upon. I would like to call upon Mr. Donald L. Corey, Supervising Sanitary Engineer in our Division of Water Pollution Control in the Department of Natural Resources.

STATEMENT OF
DONALD L. COREY
SUPERVISING SANITARY ENGINEER
DIVISION OF WATER POLLUTION CONTROL
MASSACHUSETTS DEPARTMENT OF NATURAL RESOURCES
BOSTON, MASSACHUSETTS

MR. COREY: Thank you.

Mr. Chairman, conferees, ladies and gentlemen, I also have a prepared statement on oil pollution abatement. I would like to summarize, but I request that the complete statement appear in the record.

MR. QUARLES: Very well. That will be done, without objection.

MR. COREY: The Commonwealth of Massachusetts enacted landmark oil pollution control legislation with the passage of Chapter 648 of the Acts of 1968. This law provided that the Division of Water Pollution Control would "undertake immediately, whenever there is spillage, seepage or filtration of oil into any waters of the commonwealth or into any offshore waters which may result in damage...to cause said (oil) to be contained and removed by whatever method it considers best."

A revolving fund was established to implement this provision, and the procedure was specified for recovery of costs and expenses incurred by the division. Federal legislation which was enacted several years later follows this basic format.

The Massachusetts oil pollution law and subsequent amendments also gave the division substantial authority over the operation of marine oil terminals and required evidence of financial responsibility by all vessels transferring petroleum cargoes in Massachusetts waters.

Since passage of this legislation, substantial progress has been made in abating oil pollution throughout the Commonwealth, and most notably in Boston Harbor, where over half of the Commonwealth's oil terminals are located. The chronic oil film that was formerly prevalent in the harbor has noticeably diminished. There has been an observable return of fish populations, as well as reported sightings of harbor dolphins, even in Chelsea Creek.

The following specific areas have contributed measurably to this progress:

(1) Marine Oil Terminal Licensing. Under

Massachusetts law, every marine oil terminal is inspected and licensed annually. Under this licensing provision, numerous deficient conditions have been corrected. In particular, oil-water separators have been or are being installed in virtually every terminal where stormwater runoff is subject to potential oil contamination. Defective dock hoses have been ordered replaced, and housekeeping in dock and rack transfer areas, as well as throughout the terminals, has generally been upgraded.

Between the separators and other conditions which have been corrected, the investment in facilities, estimated in the vicinity of $1 million, has prevented and will continue to prevent a number of oil spills.

(2) Control of Shipping. Effective January 1, 1971, every vessel entering Massachusetts waters to transfer petroleum products must now provide evidence of financial responsibility to the division to cover cleanup costs, damages to natural and recreational resources of the Commonwealth, and other oil liability claims.

This statute was necessitated by the failure of the Federal Government to provide, in the Water Quality Improvement Act of 1970, for reimbursement of cleanup costs to governmental bodies other than the U. S. Government or to extend coverage for liability claims other than cleanup costs arising out of pollution incidents.

Additionally, the division has brought pressure to bear on major oil companies to improve the caliber of voyage- or sport-chartered foreign-flag vessels sent into Massachusetts ports. In the past, this class of vessel has caused a disproportionate number of oil pollution problems.

(3) Prompt Reporting and Control of Oil Spills. Reporting of oil spills to the division has improved significantly in the past several years. This has permitted prompt investigation and usually identification of the sources now. Particular note is made of the cooperation and coordination between the U. S. Coast Guard and this division in investigating and combatting oil spills in Boston Harbor.

Rapid response in reporting spills has also generally permitted prompt containment and minimal damage from spills. All marine oil terminals must, by Massachusetts law, have booms available, and a number also have pickup devices and absorbants. We have an extraordinary amount of good equipment available in Massachusetts and in Boston Harbor which reflects the current state of the art.

Additionally, this division has a standby contract with one of the firms and will immediately initiate oil containment and removal if the source of a spill is unknown or if the responsible party fails to act.

In the past 3 years, the division has expended about $250,000 statewide on oil spills, approximately half of which is recoverable. During this time the Federal Government has not expended any funds on oil cleanup in Massachusetts, other than spills from Federal facilities in Boston Harbor and spills from U. S. public vessels. The total cost for cleanup of oil spills in Massachusetts is estimated at $1 to $2 million annually. More than 90 percent are cleaned up by the responsible parties.

(4) Voluntary Industry Cooperation. Almost every oil company (and most notably the major oil companies) has not only complied with orders and recommendations of the division to abate pollution but has also initiated its own program. In many cases, decisions to modernize older terminals or to install facilities to minimize stock losses have been based on other operational factors; however, the secondary effect has been to further reduce oil pollution.

In addition to the funds which are expended directly on oil pollution control facilities, an estimated $1 million is being spent annually on improved plant facilities which contribute to reduced oil pollution.

Having indicated areas where progress has been made, we also wish to include in the record three areas where we believe positive action by the Federal Government is required.

First, as noted above, the Federal Government has not had to expend any funds for oil spill cleanup in Massachusetts other than for pollution caused by Federal facilities or operating forces. This policy is consistent with the National Oil Contingency Plan, which places primary responsibility on local and regional bodies to control oil pollution.

While we are relatively satisfied with the present cleanup program, it is our understanding that significant funds are expended to clean up spills in other States which do not have an active oil pollution control program. These States are, in effect, being subsidized or rewarded for their lack of action.

We urge that clearer guidelines be established by Federal Agencies for equitable allocation of funds and resources for oil pollution control.

Second, the Water Quality Improvement Act of 1970 provided that any person causing an oil spill would be liable to the U. S. Government for the actual costs incurred for the removal of such oil by the U. S. Government up to an established maximum. Thus, in the Water Quality Improvement Act of 1970 the Federal Government on the one hand has pressed for State or local response to oil spills, but on the other hand, implementing other phases of the same act, has specifically omitted these agencies from protection under the financial responsibility certificates which are issued in compliance with this Federal law.

As a result, Massachusetts and other States have been forced to pass similar legislation to provide at least comparable protection against financial losses which may be incurred in cleaning up oil spills. This has created a costly administrative burden both to the respective State agencies and to the shipowners, oil companies, marine underwriters, and bonding companies.

We feel there is a clear need to amend this provision of the Federal law to extend equal financial protection to State or local government agencies for the removal of oil spills by those agencies and to increase financial coverage to include other oil liability claims beyond cleanup costs.

Third, and finally, it is clear that

discharges of oil from vessels will continue to occur, be it from bilges, dirty ballast or other sources, as long as the vessels are physically able to discharge directly overboard. Presently, many such discharges have at best been moved from harbor to offshore coastal areas. We feel there is a distinct requirement for separation of oil from bilge or ballast discharges on all powered vessels other than gasoline-engine-driven vessels, including U. S. public vessels.

Because this problem transcends State boundaries, we feel that Federal legislation or regulations would appear to be the most practical solution. These proposed regulations would be comparable to Federal vessel sanitation regulations which are currently under development.

The Massachusetts Division of Water Pollution Control intends to continue to do its utmost at the State level to further reduce oil spillage in Massachusetts waters. The cooperation of the Federal Government in alleviating continuing problems, which I have just enumerated, is important to the overall success of the program.

Thank you.

MR. QUARLES: Any comments?

MR. PAHREN: As I understand it, you indicated if you spend certain funds you cannot get reimbursed under the Clean Waters Restoration Act of 1970. Is that a correct statement?

MR. COREY: That's right. The law states specifically it is only reimbursable to the United States Government.

MR. PAHREN: Right.

MR. COREY: It has been interpreted to mean-- Yes.

MR. PAHREN: I might point out in Pennsylvania the United States Government got a bill from Pennsylvania on some work that resulted from one spill, with the U. S. Government going to court to try to get it back from the particular industry involved. There has been no court ruling.

I am just pointing that out as something that did happen.

MR. COREY: This is one of the areas where we just feel the guidelines are not entirely clear at this point.

MR. QUARLES: I think it is helpful to get your comments.

The experience in the national effort to control oil spills and to provide for their cleanup is still at at early stage. I am sure there is a great deal to learn. I expect that you have dealt with Mr. Kenneth Biglane of the Environmental Protection Agency, but I would encourage you particularly to contact him if you have not with these views. We are grateful to have them as part of this record, Mr. Corey.

We thank you for your statement.

Mr. Brownell and Mr. McMahon, I understand that this completes the list of people you wish to have make presentations --

MR. BROWNELL: Yes, it does.

MR. QUARLES: -- under the auspices of the Commonwealth.

We are anxious, even at this late hour, that an opportunity be provided to any members of the audience, if there are some, who wish to make a statement.

(No response.)

I do not see any persons indicating their desire to make a statement, so I think we can move toward completion of the day's proceedings.

It has been a long day, and a great many statements have been made that I hope will provide a clearer understanding of the problems and some suggestions as to what the solutions might be to move forward in meeting the common concern of us all.

I thank you all for your participation and also express appreciation to those of you in the audience who have been present with us throughout the day to learn more about the problem, and I am sure you will be able to contribute along the way.

This will conclude the open public portion of this conference session. We will now go into executive session, with the hope of reaching some agreement on recommendations and conclusions which might be announced tomorrow at 10 o'clock at the offices of the Environmental Protection Agency on the 23rd floor of the Kennedy Building.

If there are no further comments, the meeting is closed.

(Whereupon, at 4:35 p.m., the third session of the conference was adjourned.)

* * *

BOSTON HARBOR CONFERENCE - THIRD SESSION
October 27, 1971
(Regional Administrator's Recommendations to the
Commonwealth of Massachusetts.)

1. The town of Hull continue its existing program toward completion of a secondary wastewater treatment plant in conformity with the following implementation schedule:

Final plans submission	June 1972
Start of construction	September 1972
Facility in operation	December 1973

2. The Metropolitan District Commission supply the Environmental Protection Agency by December 1, 1971, with a list of all tidegates, regulators, stoplogs, and other control devices in the Boston main drainage system together with an implementation schedule for the rehabilitation of each of the same, satisfactory to the Massachusetts Division of Water Pollution Control and the Environmental Protection Agency, which implementation schedules shall specify dates for the complete rehabilitation of each of the same on or before May 1, 1973.

3. The Massachusetts Division of Water Pollution Control by February 1, 1972, will obtain a complete list of all combined sewer overflow structures appurtenant to the metropolitan sewerage system located in the cities of Boston, Cambridge, Chelsea, and Somerville and, after consultation with the Environmental Protection Agency, issue orders to said cities by March 1, 1972, to complete the rehabilitation of all tidegates, regulators, stoplogs, and other control devices on those structures, such orders to specify dates for the rehabilitation of each of such structures.

4. The Metropolitan District Commission complete the diversion of Squantum sewage to Nut Island by June 1972. The Metropolitan District Commission will notify the Environmental Protection Agency when construction will start.

5. The city of Boston and the Metropolitan District Commission shall prepare and implement plans for closing the combined sewer outfalls along the beaches of South Boston and Dorchester. Engineering plans should be completed by December 1972 and at that time a schedule for construction will be submitted by the Metropolitan District Commission to the Massachusetts Division of Water Pollution Control and the Environmental Protection Agency.

6. The Metropolitan District Commission shall complete a study of the alternative methods for the disposal of sludge from its Nut Island and Deer Island treatment plants by April 1, 1972. The Metropolitan District Commission shall decide upon an alternative for the disposal of such sludge by July 1, 1972. An implementation schedule for the construction of facilities required shall be established by July 1, 1972.

7. The Massachusetts Division of Water Pollution Control immediately address itself to the problem of the need for secondary treatment in order to meet Federal water quality standards in Boston Harbor and inform the Environmental Protection Agency of its conclusions.

8. That the Metropolitan District Commission improve and expand the enforcement of its existing regulations in order to abate the pollution resulting from the substantial quantity of toxic materials being discharged to the MDC sewerage system and then to Boston Harbor.

9. The cities of Somerville and Chelsea shall be ordered to hire by June 1, 1972, consultants, if such consultants are determined by the Massachusetts Division of Water Pollution Control to be necessary, to investigate the adequacy of their sewer systems and to make recommendations to rehabilitate the systems and to abate pollution from combined sewer overflows. Upon completion of these studies, implementation schedules are to be established by the Massachusetts Division of Water Pollution Control to construct the necessary pollution abatement facilities.

10. The city of Cambridge meet the following implementation schedule established by the Commonwealth of Massachusetts for the separation of Cambridge's combined sewer overflow:

Phase I	September 1972
Phase II	September 1973
Phase III	September 1974
Phase IV	September 1975
Phase V	September 1976

11. The city of Boston begin to implement the recommendations of its consultants to rehabilitate and expand the existing sewer system, and that a schedule for such work be developed by the city of Boston

for the consideration and approval of the Massachusetts Division of Water Pollution Control.

12. The New England River Basins Commission is to continue to develop a water quality management plan for the Boston Harbor drainage area, in cooperation with the State and Federal Agencies concerned.

☆U.S. GOVERNMENT PRINTING OFFICE: 1972 484-482/13 1-3